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ABSTRACT

This report serves as a guideline for fire service education. For men filling the estimated 10,000 opportunities in career fire department organizations each year in the 1970s, it is necessary that they receive a supplement to department-level training in drills and skills. Knowledge of hydraulics, chemistry, mechanical engineering, law enforcement, and business education is as important to the modern fire fighter as is knowledge of the ropes and ladders. The number of 2-year colleges offering programs in fire service has increased 50 per cent in the past five years. The 2-year college can offer occupational and technical education, semi-professional training, and personal counseling. Such programs attract in-service fire fighter students, attending mostly evening courses, as well as people from such fire-related fields as oil and chemical corporations and insurance companies. There are suggested curriculum patterns for Fire Science Associate Degree and Fire Science Certification programs. The International Fire Administration Institute provides assistance to the nation's fire departments and to the colleges. Other similar organizations are listed. This report offers a complete description of fire fighter entry qualifications and duties. (CA)

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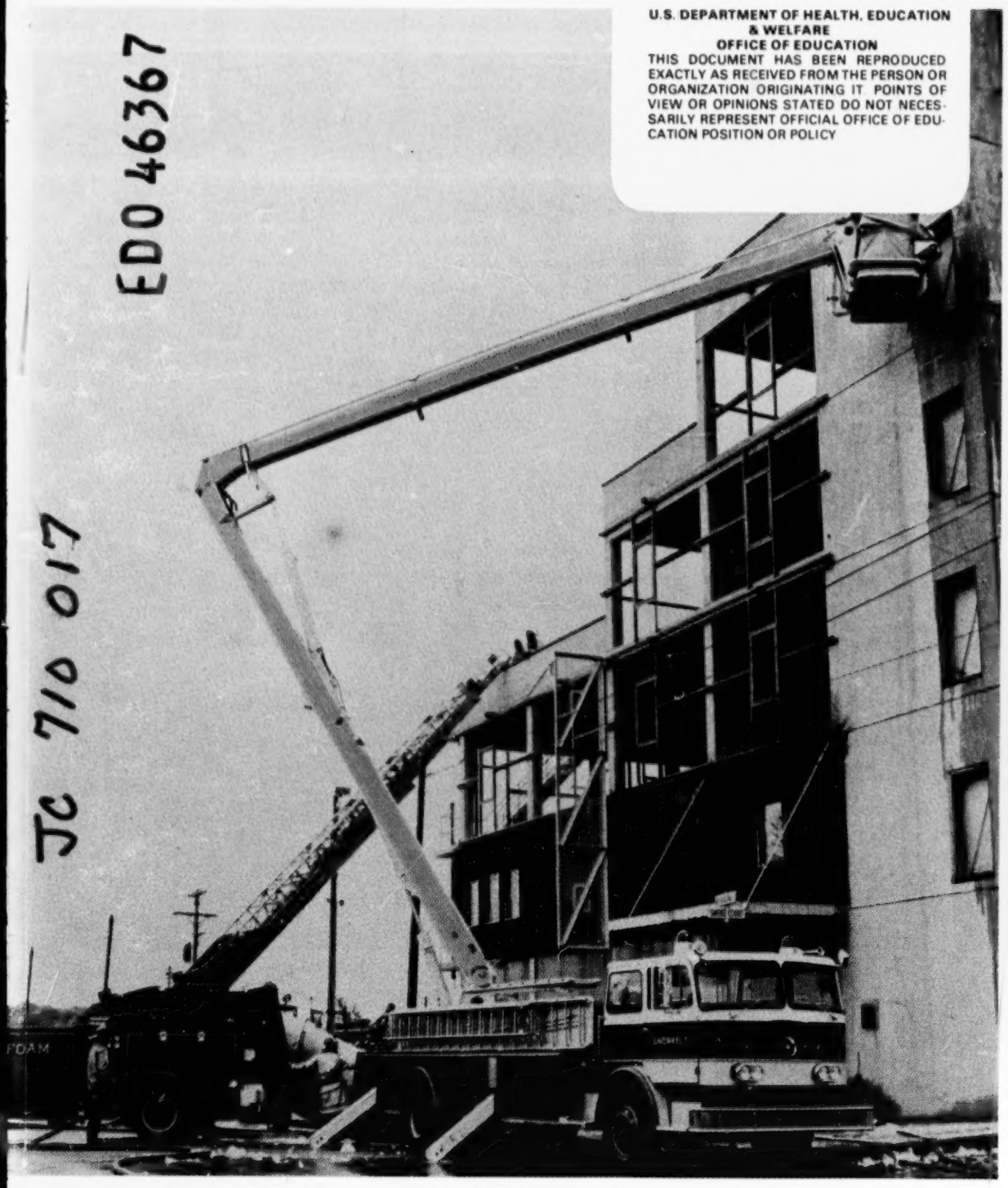

GUIDELINES FOR

FIRE SERVICE EDUCATION PROGRAMS

IN COMMUNITY AND JUNIOR COLLEGES

UNIVERSITY OF CALIF.
LOS ANGELES

JAN 25 1971

CLEARINGHOUSE FOR
JUNIOR COLLEGE
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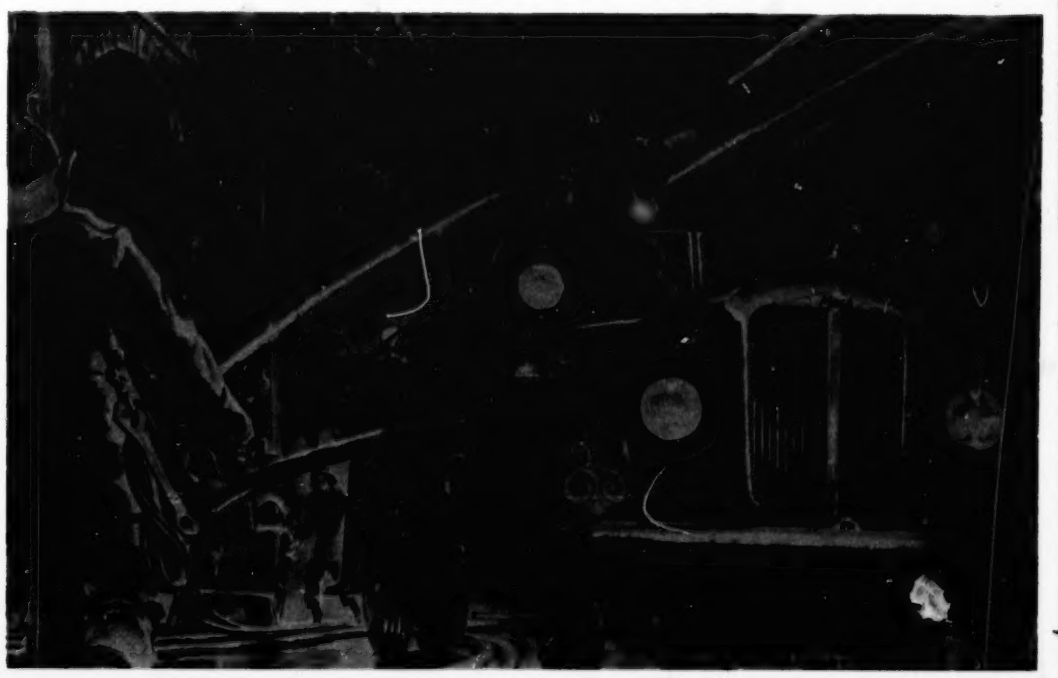
BY DONALD F. FAVREAU, EXECUTIVE DIRECTOR, INTERNATIONAL FIRE ADMINISTRATION INSTITUTE, STATE UNIVERSITY OF NEW YORK AT ALBANY



A VALIANT CAREER

The nation's fire service offers you a rewarding and satisfying job. It offers you a valiant career.

Today's firefighter is highly specialized and thoroughly schooled in the use of materials and appliances. In addition, he has sound education in chemistry and physics; he is highly intelligent and possesses considerable mechanical skill.

Today's firefighter must know about hydraulics, if he is to make intelligent use of water streams in extinguishment of fire; about chemistry, if he is to fight fire with chemicals; about mechanical engineering, if he is to maintain fire-fighting apparatus and equipment; about law and enforcement, if he is to conduct fire prevention and fire protection programs; about business management and administration, if he is to be responsible for the operation of a fire department, either paid or volunteer.

Above all, his courage must transcend his fear of death—the recognition that his service, his profession—is the most hazardous of all.

Grope with him through a hot, smoke-choked hallway . . . with a charged line, with axes and plaster hooks . . . his ammo to fight the enemy . . . climb a ladder through a cloud of super-heated smoke and air . . . Then battle the blaze no other will challenge.

Physical courage. Knowledge and experience. Intelligence. Valor. These are the prerequisites for a valiant career in the nation's Fire Service.

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

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FOREWORD

The demands arising from continued technological progress and increasing emphasis on fire prevention have brought about urgent manpower concerns on the part of the fire service. In an effort to adequately respond to the educational needs that were becoming apparent, the International Fire Administration Institute and the American Association of Junior Colleges considered the various methods through which community colleges could assist. It was noted that a variety of educational programs had emerged in recent years, and leaders in the field were rightly concerned that program direction be aimed properly. Following a series of regional advisory meetings, this publication has been developed as a guideline for fire service education. No doubt at all exists as to the support which community colleges can anticipate from leaders in the fire service, and this document should serve to substantiate the requests from that important segment of public safety. Fire science rests upon an immense body of technical information, yet few members of that service have had access to more than departmental-level training in drills and skills. Whether full-time or volunteer, the nation's fire fighters deserve every serious consideration and priority for educational advancement if community colleges are to fulfill their responsibilities to local government. AAJC expresses its appreciation to the members of the regional advisory committees whose time and talents were vital to this publication. Particular thanks are also due to the Board of Trustees of the International Fire Administration Institute and, of course, to the executive director of that body, Donald F. Favreau, for serving as author.

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CHAPTER I

THE FIRE SERVICE AND THE MANPOWER OUTLOOK

Today's fire service executives have inherited a set of manpower utilization problems as challenging as they are complex. Progress in the medical sciences, abnormally low birth rates in the 1930's, and a large upturn of births in the 1940's and 1950's have left the passing decade with a work force that is heavily weighted with inexperienced and older persons at each end of the labor market spectrum, while deficient in the prime working age (11).* This age group (26 to 44) is an important source of skilled manpower and new blood for officer-level jobs.

The labor force reached a new high of 82.5 million in 1968, a gain of over 9 million persons from 1961 (10:50). Youths sixteen to twenty-four years of age represented over 50 per cent of this sharp increase (10:50).

The manpower utilization problem is further compounded by the tremendous technological achievements since World War II, coupled with sophisticated research findings in the behavioral sciences; emergence of new patterns of labor-management relations; recruiting competition from the private and public sector; a significant increase in the number of managerial positions required to achieve the objective; and the fire protection problems of the super-city of the future which is already on the drawing boards.

Occupational Employment Trends

According to *Occupational Outlook*, a publication of the Bureau of Labor Statistics, U.S. Department of Labor, the nation's occupational changes of the past eight years were essentially a continuation of the rapid growth in evidence since World War II. It should be noted, however, that large employment gains occurred among protective service workers, i.e., policemen and firemen (10:38).

It is estimated that more than 10,000 firefighter opportunities in career fire department organizations will occur each year during the remainder of the sixties and through the seventies. The majority of these openings will occur due to normal attrition and increased service demands by expanding communities. The fire service is unique in that the replacement rate is higher and more frequent than many occupations, as fire service personnel are permitted to retire at an earlier age. In addition to normal attrition, many job classifications will be created as metropolitan fire departments enlarge their staffs to meet the ever-demanding service requirements to today's esoteric and sophisticated firematic challenges (19:296).

Manpower projections prepared by state and local agencies repeatedly reinforce the national manpower projections. The Metro Fort Worth Texas Manpower Outlook is a typical example and dramatically calls attention to the existing sense of urgency regarding manpower utilization in the fire service. The Fort Worth manpower projection shows a continuing need for trained firefighters through 1975, i.e., from 617 firefighters employed in 1965, a projection to 1970 and 1975 indicates that 915 and 1,113 are needed respectively.

The projection of the Planning Department of Metropolitan Dade County, Florida, indicates that their fire service manpower requirements will be more than doubled by 1979. This projection is based on a systematic increase from the present 1.14 fireman per 1,000 population to an anticipated 1.75 fireman in 1979. The present population of 1,263,000 will climb to 1,668,000 by 1979 (see Figure I).

Figure I: Population and Fire Service Manpower Projection for the Greater Miami Metropolitan Dade County, Florida

Year:	1969	1972	1974	1979
Population	1,263,000	1,359,000	1,450,000	1,668,000
Fire Service Manpower	1,437	1,821	2,102	2,919
Firefighter Per 1,000	1.14	1.34	1.45	1.75

* *Bracketed numbers refer to bibliographical entries on page 43.*

Sextant Systems, Inc., publishers of career-exploration guides for school and industry, lists in its newly published *Protective Agencies* volume the following career patterns in the fire department:

Fire chief

Chief fire marshal

Deputy chief

Assistant fire chief

Fire prevention captain

Fire prevention lieutenant

Fire investigation lieutenant

Firefighter—
Bureau of Fire Prevention and Investigation

Deputy chief—firefighting

Battalion chief

Fire captain

Fire lieutenant

Motor pump operator

Firefighter—career

Fire boat pilot

Marine engineer

Firefighter—volunteer

Chief dispatcher—Fire alarm and telegraph

Assistant chief dispatcher

Fire alarm dispatcher

Superintendent—Bureau of Machinery and Apparatus

Automotive mechanic supervisor

Fire equipment mechanic

Fire equipment repairman

Deputy chief—training and special services

Fire physician

Motor vehicle operator instructor

Fire captain—training

Fire lieutenant—training.

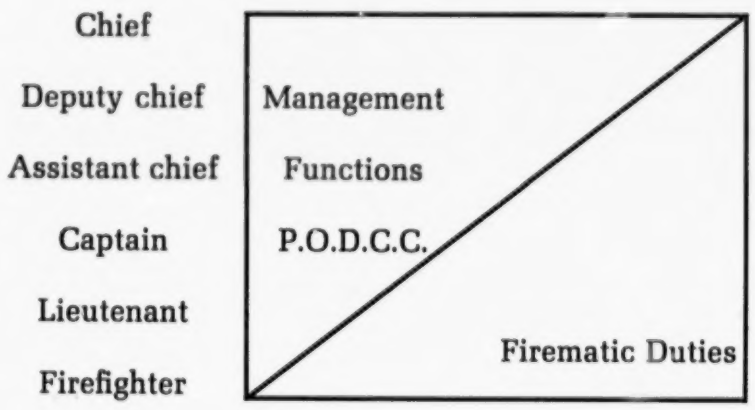
The Fire Department Pyramid

The chief executive officer in the fire department has a number of titles, e.g., chief of department, chief fire marshal, director, superintendent, and chief engineer. As the chief executive officer, he is charged with the responsibility of guiding human and physical resources into dynamic organization units which achieve their objectives to the satisfaction of those served (the taxpayer) with a high degree of morale (*esprit de corps*) on the part of those rendering the service.

He plans, organizes, directs, coordinates, and controls (P.O.D.C.C.) men, money, and materials—and welds them into a smooth-working, effective team. In addition to being technically competent (fire science), he must be conceptually and perceptually competent as an administrator.

Figure II shows how descending in the organization the chief officer's management duties give way to the technical duties of the firefighter.

Figure II: Managerial Duties vs. Firematic Duties



A Valiant Career

The nation's fire service offers to those who qualify a career opportunity in a valiant profession. Because of the hazardous physical duties he must perform, there are a number of entry qualifications which must be met prior to appointment. A profile of the average firefighter may be derived from Figure III.

Firefighting today has become highly specialized and sophisticated. The recruit firefighter must have a high school diploma, and in a growing number of communities an associate degree is required (see Appendix). Since firefighters must live and work closely together, extreme care is taken during the selection process to accept only those candidates who will enhance the professional posture of the fire service; emphasis is placed on physical courage, personality, and character. Figure I V summarizes the personnel selection process utilized by a number of fire departments.

Figure III: RECRUIT SELECTION—MINIMUM PRESELECTION REQUIREMENTS

City	Age	Education	Residence	Height Min.-Max.	Weight Min.-Max.	Eyes	U.S. Citizenship	Convictions (Fellony)	Mental Health	Hearing	Driver's License	Medical	Speech	Swimming
ALEXANDRIA, VA. 120,000 Pop.	21	H. S.	21 Mi. Radius	5'-8"	150	20/20	X	May Reject	X	X	X	X	X	O
BISMARK, N. D. 30,000 Pop.	20-30	H. S.	X by Appt.	O	O	20/50 Corr. to 20/30	X	Reject	X	X	X	X	X	O
DAYTON, OHIO 272,000 Pop.	20-30	H. S.	X	5'-7" 6'-2"	P	20/30	X	Reject	X	X	X	X	O	O
DENVER, COL. 530,000 Pop.	21-29	H. S. or Equiv.	X State	5'-7"	P	20/40 +Color	X	Reject	X	X	O	X	X	O
HAMILTON, ONT. 285,649 Pop.	18-27	10 Years	X	O	O	O	O	Reject	O	O	X	X	O	O
JAMESTOWN, N. Y. 42,000 Pop.	21-33	H. S. or Equiv.	X	5'-6" 6'-5"	P	20/30 Uncorr. +Color	X	Reject	X	X	X	X	O	O
LOS ANGELES CO., CALIF. 1,777,460 Pop.	21-30	H. S.	X	5'-8" 6'-7"	140 239	20/30 Uncorr. +Color	X	O	X	X	X	X	O	O
MADISON, WIS. 170,000 Pop.	21-29	H. S.	X	5'-7"	P	No Glasses	X	Reject	X	X	O	X	O	O
MEMPHIS, TENN. 570,000 Pop.	21-33	H. S.	X	5'-8" 6'-3"	160 210	20/20 Uncorr.	X	Reject	X	X	O	X	X	O
MIAMI, FLA. 325,000 Pop.	21-29	H. S.	X	5'-7" 6'-3"	133 202	20/30 Corr. to 20/20	X	Reject	X	X	X	X	X	X
MONTREAL, QUE. 1,430,000 Pop.	19-26	10 Years	X	5'-8"	P 140+	O	O	Reject		O	O	X	O	O
RACINE, WIS. 93,000 Pop.	21-35	H. S.	X State	5'-8" 6'-5"	145 240	20/50 Corr. to 20/20	X	Reject	X	X	O	O	X	O
ROCHESTER, N. Y. 320,000 Pop.	20-30	H. S.	X	5'-7"	P 135	20/30 Uncorr.	X	Reject	X	X	X	X	O	O
SILVER SPRING, MD. 85,000 Pop.	19-31	H. S.	X by Appt.	5'-7" 6'-5"	P 145—	20/40 Uncorr. 20/20 Corr.	X	May Reject	X	X	X	X	X	O
SIOUX CITY, IOWA 90,000 Pop.	21-30	H. S. or Equiv.	X	5'-8" 6'-5"	P 135—	20/30 Uncorr.	X	Reject	X	X	X	X	O	O
WICHITA, KANSAS 280,000 Pop.	18-31	H. S. or Equiv.	X by Appt.	5'-9" 6'-3"	160 230	20/40 Uncorr. 20/20 Corr.	X	Reject	X	X	X	X	X	O

P WEIGHT PROPORTIONATE TO HEIGHT—X CURRENT PRACTICE—O NOT CONSIDERED

Courtesy of International Fire Administration Institute

Figure IV: ACCEPTANCE AND PREVIOUS TO TRAINING

City	Civil Service Control	Strength Test	Agility Test	Endurance Test	General Aptitude and Knowledge	Medical	Personality	Oral Interview	Mechanical Aptitude	Performance on Related Activities	Intelligence	Probation	Character Investigation
ALEXANDRIA, VA. 120,000 Pop.	O	O	O	O	X	X	O	X	X	X	X	X	X
CHICAGO, ILL. 4,000,000 Pop.	X	O	O	O	X	X	O	X	O	X	X	X	X
DAVENPORT, IOWA 97,000 Pop.	X	O	X	O	O	X	X	X	O	O	X	X	X
DAYTON, OHIO 272,000 Pop.	X	O	O	O	O	X	O	X	O	O	O	X	X
HAMILTON, ONT. 285,649 Pop.	O	O	X	O	X	X	O	X	X	O	O	6 Mo.	X
LOS ANGELES CO., CAL. 1,777,460 Pop.	X	O	O	O	X	X	O	X	O	O	X	6 Mo.	X
MEMPHIS, TENN. 570,000 Pop.	X	O	X	O	X	X	O	X	O	O	X	X	X
MIAMI, FLA. 325,000 Pop.	X	X	X	X	X	X	O	X	O	O	X	6 Mo.	X
MONTREAL, QUE. 1,430,000 Pop.	X	X	X	X	X	X	X	X	O	O	O	X	X
RACINE, WISC. 93,000 Pop.	X	O	X	O	X	X	X	X	X	X	X	6 Mo.	X
WICHITA, KAN. 280,000 Pop.	O	O	O	O	O	O	O	X	O	O	O	X	O

X CURRENT PRACTICE—O NOT CONSIDERED

Courtesy of International Fire Administration Institute

THE FIREFIGHTER'S JOB DESCRIPTION *

I. Work Performed

A. Saving life and effecting rescue (nonfire emergencies)

1. Applying manual artificial respiration
2. Administering first-aid
3. Searching out victims
4. Removing victims
5. Effecting water rescue
6. Using life-saving equipment
7. Effecting electrical rescue
8. Controlling panicked people
9. Performing heavy rescue if required

B. Protecting life and property against fire

1. Receiving and responding to alarms
2. Making proper emergency entrance
3. Using portable extinguishing devices
4. Using ropes
5. Handling and using ladders properly
6. Handling and using hose properly
7. Producing and applying efficient fire streams
8. Salvaging
9. Overhauling
10. Using tools and equipment properly
11. Driving and operating fire apparatus
12. Effecting proper ventilation
13. Effecting rescue from burning buildings
14. Administering first-aid to the injured
15. Using protective equipment
16. Using radio equipment
17. Surveying properties for firefighting
18. Recognizing and preserving evidence of causes of fire
19. Restoring apparatus and equipment to service after use

C. Noncombat duties

1. Caring for the station
2. Caring for apparatus and equipment
3. Caring for and testing hose
4. Standing watch
5. Training and drilling under supervision
6. Performing public relations duties
7. Doing fire prevention and operation-hazard inspection
8. Doing fire prevention activities, if required
9. Inspecting and reporting conditions of hydrants
10. Reporting fire protection violations to proper authorities

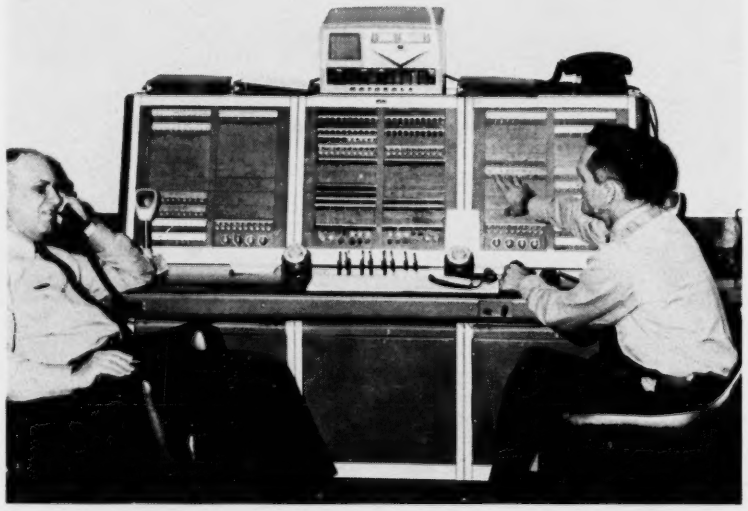
II. Performance Requirements

A. Responsibilities

1. Exemplary conduct
   a. Mannerisms
   b Appearance
   c. Language
   d. Social behavior
   e. Habits
2. Professional workmanship
3. Favorable community relations
4. Effective fire safety in a community
5. Knowing and abiding by department rules and regulations
6. Cooperation, vertically and laterally
7. Personal development
8. Personal and company safety

B. Job Skills

1. Ability to handle and use hand and power tools and ropes
2. Ability to handle and use hose and hose accessories
3. Ability to handle and use ladders
4. Ability to climb and work on ladders
5. Ability to handle and use portable extinguishers
6. Ability to perform salvage and overhaul work
7. Ability to drive a fire truck and to operate a pump and an aerial ladder if required
8. Ability to do rescue and first-aid work



* *City of Chicago, Illinois, Department of Fire. Reprinted with permission.*

9. Ability to do inspections and make surveys, if required
10. Ability to perform all station duties efficiently
11. Ability to wear and use safety equipment

C. Job understanding

1. A good understanding of fire service functions, requirements, and responsibilities, and their relation to other municipal services
2. Necessary understanding of all job skills listed above
3. A good understanding of the construction and use of apparatus and equipment used in the fire service including care and safety
4. A good understanding of self as to health habits, feeding, and self-protection
5. An understanding of the principles of burning, and the causes and control of fire

D. Job relations

1. The ability to assume the responsibilities listed above
2. Possession of the proper characteristics and attitudes that will assure good company relations, and the proper respect for officership
3. Proper attitude toward the community and citizens that will command respect for the fire service
4. Proper conduct at all times

E. Physical fitness

1. Meeting medical and physical examinations as required
2. Maintenance of physical fitness at all times
3. Exercising emotional control.

Another trend having a significant effect on increasing the number of job openings is taking place as career firefighters replace volunteer firefighters in growing suburbia. The *Wall Street Journal* points out that an ever-growing number of towns are being forced to hire full-time career firefighters (2).

In Prince Georges County, Maryland, a suburb of Washington, D. C., Chief Training Officer Harold Richman in 1968 initiated an officers candidate school when it became necessary to promote thirty-two firefighters to meet the needs created by the rapid expansion of the paid force. According to Chief Richman, the continuation of the officers candidate school-concept will play a vital role in

the development of the Prince Georges County fire service (13:40).

It is quite evident that the educated, well-trained student in the fire service will experience no problem in pursuing a challenging career. If anything, his principal decision will be in choosing among a variety of career fields either in the public or private sector. The following list suggests some of the career-related choices:

1. Aero space program (specialists, technicians, and consultants)
2. College instructor or administrator
3. Fire communications dispatcher (local and state government)
4. Fire control technician (state and federal forestry service)
5. Fire control technician (local, state and federal government)
6. Fire equipment manufacturing (sales, service, research, and development)
7. Fire prevention (government and industry)
8. Fire brigade (industry)
9. Insurance industry
10. Rescue services (ambulance)
11. Fire protection technician.

Career Opportunities

The fire protection technician, like the firefighter, is concerned with the prevention of life and property loss from fire, explosion, and related hazards.

The fire protection technician is a highly specialized, technically oriented individual with a broad knowledge base. His services are utilized by such organizations as the American Insurance Association, Underwriters Laboratories, Factory Insurance Association, Oil Insurance Association, in addition to a number of government agencies, e.g., Atomic Energy Commission, the Department of Defense, The National Bureau of Standards, and National Space Administration, to name a few.

CHAPTER II

FIRE SERVICE ADMINISTRATION: EDUCATION AND RESEARCH

In February, 1966, ten of the nation's leaders in the nation's fire service met at the Johnson Foundation Research Center, Racine, Wisconsin, to "isolate and define" problems facing the fire service in the next decade so that additional research and study could be given to problems where a sense of urgency exists. The conferees summarized their observations and conclusions by formulating twelve statements of national significance. These statements, though broad in scope, focused sharply on the educational dimension and read as follows (9:2):

1. Unprecedented demands are being imposed on the fire service by rapid social and technological change.
2. The public is complacent toward the rising trend of life and property loss by fire.
3. There is a serious lack of communication between the public and the fire service.
4. Behavior patterns of the public have a direct influence on the fire problem.
5. The insurance interest has exerted a strong influence on the organization of the fire service. This dominance seems to be waning. The fire service must provide the leadership in establishing realistic criteria for determining proper levels of fire protection.
6. Professional status begins with education.
7. The scope, degree, and depth of the educational requirements for efficient functioning of the fire service must be examined.
8. Increased mobility at the executive level of the fire service will be important to the achievement of professional status.
9. The career development of the fire executive must be systematic and deliberate.
10. Governing bodies and municipal administrators generally do not recognize the need for executive development of the fire officer.
11. Fire service labor and management, municipal officers and administrators must join together, if professionalism is to become a reality.
12. The traditional concept that fire protection is strictly a responsibility of local government must be reexamined.

The International Association of Fire Chiefs at their annual conference in Boston, Massachusetts, August 1966, passed a resolution "endorsing and supporting the Wingspread Conference Report, and assisting with ways and means of facilitating some solutions and alternates to the problem areas stated in this report."

The International Fire Administration Institute's Board of Trustees also passed a similar resolution at their meeting held in Boston at the same time as the I.A.F.C. Conference.

The Wingspread Conference provided the catalyst for subsequent exploration, and early in 1967, the fire service educational thrust gained momentum at the Saratoga symposium on "Higher Education for the Fire Service" and the fire engineering symposium on "The Challenging Years for the Fire Service," held at Chicago, Illinois.

In spite of the great progress achieved by the United States in technology, social, and economic endeavors, the nation still has an unwarranted and excessive loss of life and property by fire.

Property losses soared to a record of two billion dollars in 1968. Even more alarming is the fact that our per capita fire death rate is twice that of Canada, four times that of the United Kingdom, and six and one-half times that of Japan.

Former President Johnson pointed out in his message to Congress on February 16, 1967, that loss of life due to fire in the year 1965 numbered twelve thousand men, women, and children. Mr. Johnson proposed that legislation be enacted as a part of a "major national effort to reduce our shameful loss of life and property from fires."

On March 1, 1968, Mr. Johnson signed into law the Fire Research and Safety Act of 1968 (Public Law 90-259, 90 Congress, S. 1124). At the present time, the act has not been implemented with Congressional appropriations and Presidential appointments for the organization of the National Committee.

The Fire Research and Safety Act of 1968

Title I *The Congress finds that a comprehensive fire research and safety program is needed in this country to provide more effective measures of protection against the hazards of death, injury, and damage to property. The Congress finds that it is desirable and necessary for the Federal Government, in carrying out the provisions of this title, to cooperate with and assist public and private agencies. The Congress declares that the purpose of this title is to amend the Act of March 3, 1901, as amended, to provide a national fire research and safety program including the gathering of comprehensive fire data; a comprehensive fire research program, fire safety education and training programs; and demonstrations of new approaches and improvements in fire prevention and control, and reduction of death, personal injury, and property damage. Additionally, it is the sense of Congress that the Secretary should establish a fire research and safety center for administering this title and carrying out its purposes, including appropriate fire safety liaison and coordination.*

A. *Investigation of causes, frequency, severity of fires*
B. *Research on causes of fires, improved methods, and techniques of fire prevention and control*
C. *Educational programs for the public and the firefighter; courses, seminars, and instructional material*
D. *Development of fire science curriculums.*

Title II *The establishment of a National Commission on Fire Prevention and Control to undertake a comprehensive study and investigations to determine the practical and effective measures for reducing the destructive effects of fire throughout the nation. Such a study will include:*

A. *A consideration of ways in which fires can be more effectively prevented through technological advances, construction techniques, and improved inspection procedures*
B. *An analysis of existing programs administered or supported by the departments and agencies of the Federal Government and of ways in which such programs could be strengthened so as to lessen the danger of destructive fires in Government-assisted housing and in the redevelopment of the nation's cities and communities*
C. *An evaluation of existing fire suppression methods and of ways for improving the same, including procedures for recruiting and soliciting the necessary personnel*
D. *An evaluation of present and future needs (including long-term needs) of training and education for fire service personnel*
E. *A consideration of the adequacy of current fire communication techniques and suggestions for the standardization and improvement of the apparatus and equipment used in controlling fires*
F. *An analysis of the administrative problems affecting the efficiency or capabilities of local fire departments or organizations*
G. *An assessment of local, State, and Federal responsibilities in the development of practicable and effective solutions for reducing fire losses.*

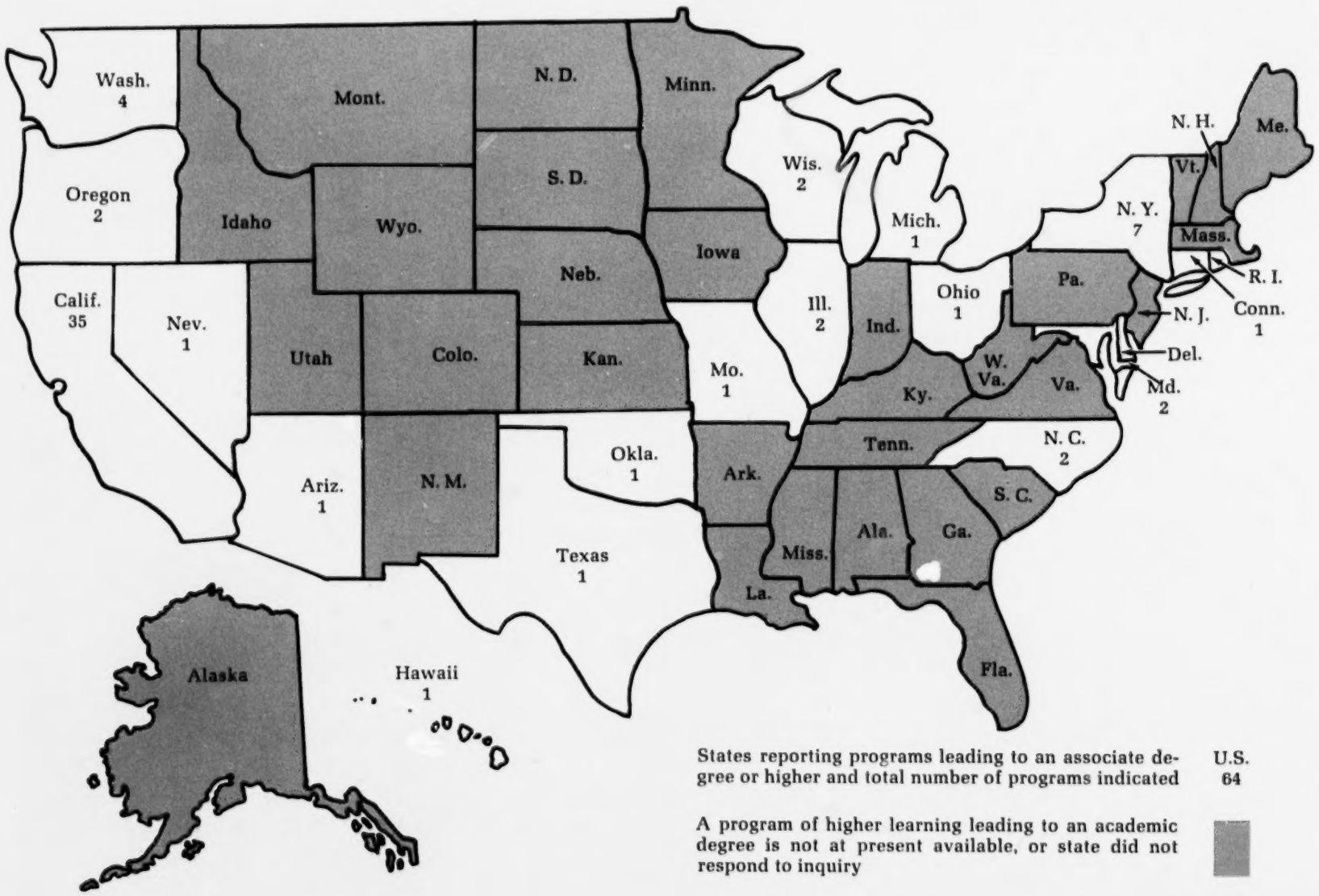
The commission will submit to the President and to the Congress a report with respect to its findings and recommendations not later than two years after the commission has been duly organized.

These developments have all contributed significantly to a noteworthy increase in the number of requests received by the International Fire Administration Institute from firefighters, fire service executives, community and junior colleges, and university administrators asking for assistance in the development and implementation of programs of higher education in the fire service. According to an International Fire Administration Institute survey, the number of two-year institutions offering programs of higher education in the fire service has increased over 50 per cent in the past five years, and enrollments in these programs are estimated to number some seven thousand students. California and New York lead the nation in the number of higher education programs for the fire service, see Figure V.

The Board of Trustees of the International Fire Administration Institute, meeting at Louisville, Kentucky, in September 1968, expressed its concern about this sharp increase in program development and implementation, especially as it related to curriculum content. The board noted that a sense of urgency existed for the development of guidelines in organizing fire science education programs at the junior and community college level. It was recommended that the I.F.A.I.'s executive director explore these concerns of mutual interest with the American Association of Junior Colleges.

AAJC also had its finger on the pulse beat of this development which facilitated a mutual agreement between both organizations to combine their resources in the development of guidelines for fire science educational programs in the nation's junior and community colleges.

Figure V: Higher Education in the Nation's Fire Service 1968



Courtesy of the International Fire Administration Institute

CHAPTER III

THE COMMUNITY COLLEGE'S ROLE FOR THE FIRE SERVICE

If one tried to characterize today's world, it is an era of change, explosive radical change, subtle change. Everything about us will change and the rate at which these changes will take place will constantly increase. It has been said, "Things are moving so fast these days that people who say it can't be done, are frequently interrupted by someone doing it."

If we plot the accumulation of recorded knowledge on a historical continuum beginning with the birth of Christ, the first doubling of knowledge took place in 1750, the second in 1900, the third in 1950, the fourth in 1960, and the fifth in 1965.

Education, an activity involving 58 million Americans, has moved beyond the schools, as a large-scale activity in industry, a new element in urban rehabilitation, a force in world economic development, and a form of adult self-realization (16:3).

Higher education is expanding at a rate greater than all other levels of education. It is quite evident that today's high school diploma is just the first credential. As General Electric Executive Virgil Day points out, "The two strands of working and learning are intertwined for the length of a man's career" (16:3).

"The adult in modern society can and does use many methods to increase his skill, his understanding, and his sensitivity. Education is no longer just a matter of childhood schooling, but has become a life-long, varied, and stimulating activity with great influence in the lives of many modern men and women" (7:6).

According to recent projections of the U.S. Census Bureau, the total number of college graduates will double by 1985, and high school graduates will jump 86 per cent.

The Carnegie Commission on Higher Education reports that a century ago 2 per cent of young Americans graduating from high school entered college. Today the figure is over 50 per cent and rapidly continuing to rise. It is now estimated that nine million Americans will be enrolled in programs of higher learning by 1975.

The nation's two-year colleges hold much promise for the fire service in meeting the manpower utilization challenges of the 1970's and 1980's as they gear up to meeting the continuing educational and manpower development needs of the community.

Edmund J. Gleazer, Jr., executive director of the American Association of Junior Colleges, reported in September 1967, that more than 175 junior colleges were in various stages of planning and development, and that by 1970 the total number would be over 1,000. He projected enrollments of nearly 2.5 million students by the early 1970's.

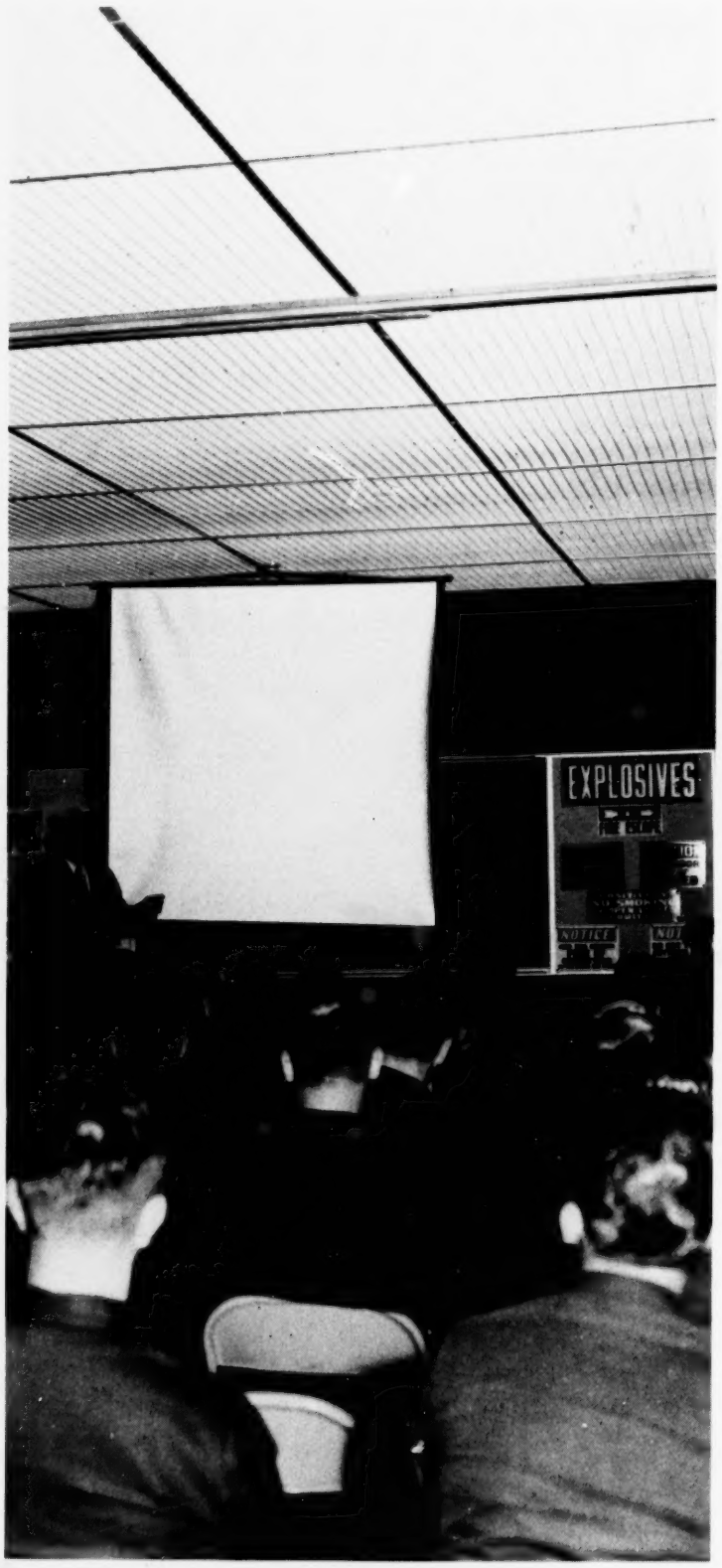
The Nature of the Two-Year College

The junior college may be regarded as the generic term to identify an institution of higher learning which offers two years of education beyond high school. Community college is the name applied to an institution which is primarily concerned with providing educational services on a collegiate level to a particular community (5:81).

The Michigan Council of Community Colleges Administration has described the community college as "a locally controlled public, two-year institution of higher education which offers broad comprehensive programs of instruction for persons of post-high school age."

The statement continues, "A community college expands opportunities for education beyond the high school by (1) offering programs in occupational, technical, and semiprofessional training for students planning to enter a vocation as well as the first and second-year college academic courses for students planning to transfer to four-year colleges or universities; (2) adhering to an "open-door" general admissions policy but being selective in those whom it retains, graduates, and recommends for placement; (3) responding to the particular educational needs of the community it serves; (4) drawing upon its community total resources in organizing its instructional program; (5) enrolling students on a full-time or part-time basis; and (6) offering day and evening classes and programs of instruction, and if economically possible, on a year-round basis."

Tyrus Hillway said, "Perhaps no institution of higher learning is better suited than the community college for the development of effective adult education. As a community-centered institution, it must be concerned with the needs of the local constituency. Its program does not end with an associate degree for the twenty-year old nor close its doors at four o'clock in the afternoon. If a school or college sincerely intends to serve its community, it must be ready to meet every type of educational need that can be detected. This invariably includes those of the adult student" (5:81).



Community College:
Advantages for the Fire Service

The community college advantages for the fire service are many and varied:

1. The community college by its very nature must keep abreast of and be familiar with the local educational needs. The fire chief will find that the college administrator is glad to cooperate in offering programs of higher education in fire science; however, there must be a demonstrated need.
2. The flexible curriculum patterns adopted by the community college facilitate innovative action to meet specific occupational needs of its students, especially mature returning students from the changing world of work. The community college is an "open-door" institution of higher learning that provides a flexibility not generally available in many senior colleges and universities (17:32).
3. The depth of experience acquired in curriculum development and continuing education program implementation makes it possible for the institution to effectively meet the vocational and semiprofessional needs of the fire service.
4. To help firefighters achieve self-realization, community colleges provide personal counseling and guidance to mature returning students, and additionally provide placement information to younger students who are facing work for the first time. The fire service can take advantage of this counseling by providing the instructor with information describing career opportunities.
5. The scheduling of day and night courses by the community college facilitates enrollment and attendance by career and volunteer fire service personnel.
6. The community college and the local fire department through mutual agreement may have the instructor "come to the fire house" and teach credit courses on paid time. Several of the nation's fire chiefs report that this is already being done successfully in their departments.

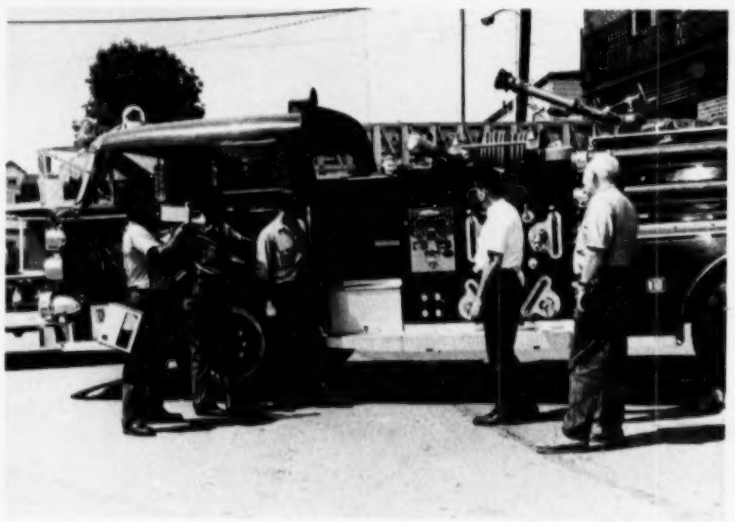
Bachelor's Degree Programs

Community college students completing an associate degree in fire science do have opportunities to continue their education at the baccalaureate level.* The University of Maryland offers a four-year degree in fire protection under the College of Engineering, and the Illinois Institute of Technology offers a four-year degree in fire protection and safety engineering. Students successfully completing the two-year program in fire science at the New York City Community College may transfer their credits to the John Jay College of Criminal Justice of the City University of New York and continue their education in the public service. In addition, California State College at Long Beach offers course options in fire administration.

For a number of years the University of Southern California had offered an option in fire administration within its regular four-year public administration degree. According to a recent study conducted by the University of Minnesota, the hundreds of Los Angeles area firefighters who participated in, and in some cases completed the degree program at U.S.C., are now serving as chiefs of many of the smaller California departments, and are in positions of leadership within its professional and educational institutions (12:10).

The Minnesota Advisory Committee on Fire Protection and Fire Prevention Education has recommended that the University of Minnesota consider offering a four-year degree program in fire technology (12:7). Toward that goal, the Fire Service Education and Research Information Center has recently been established within the General Extension Division of the University of Minnesota. The center will serve these functions:

1. Coordinate and integrate the state's fire service educational process
2. Plan, develop, and evaluate courses, curriculums, programs, and seminars offered by the cooperating institutions.
3. Develop teaching materials and aids
4. Collect materials and assemble a library appropriate to its purpose
5. Disseminate information derived from the center's program
6. Integrate research already available to assist in meeting educational and technical needs for the fire service
7. Provide consultation service to fire departments and municipalities in the state.



* For a complete list of fire science degree programs available in the U.S., see Appendix B.

CHAPTER IV

ENROLLMENTS

Fire science programs will attract many groups of students. The largest potential group is in-service students (numbering some 200,000) presently employed in the paid fire service (2). In a great number of cases the student will be mature, out of school a few years with a desire to enhance his educational posture. This adult student requires careful consideration of the counselor, faculty, and administration. Since he is employed full time, he will probably enroll in the evening division of the institution.

A number of cities are paying firefighters to return to the classroom. An example of such an innovative approach is the educational incentive plan adopted by the city of Madison, Wisconsin (4:50).

The incentive salary steps are based on points, e.g., an associate degree in fire science is worth 70 points. Each approved semester hour of college credit is worth one point. Figure VI lists the incentive salary steps:

Figure VI: Madison, Wisconsin—Salary Step and Point System

Incentive step	Increase above basic salary (percentage)	Points required
5	16%	150
4	12	85
3	9	45
2	6	25
1	3	15

The Dallas, Texas, Fire Department provides an educational incentive pay plan. Effective June 1, 1969, members qualify for the pay in increments of three semester hours of approved college courses. Beginning on that date, a fireman is paid $4 per month for each three approved college semester hours, to a maximum of thirty hours or $40. In

addition, the first fifteen semester hours must include a minimum of three semester hours of English composition or grammar. Members must have completed six semester hours of English composition or grammar to qualify for thirty hours as well as full educational incentive pay. The purpose of this is to enable members to qualify for the incentive pay more rapidly and to further stimulate interest. The method of qualifying for the full educational incentive pay ($82 for an associate degree) remains the same. Currently, some 255 firemen are receiving all or a percentage of the educational incentive pay.*

The state of Connecticut passed legislation requiring municipalities to reimburse fire service personnel for tuition and textbooks (see Appendix C). This type of legislation provides motivation and facilitates enrollment.

The Commonwealth of Massachusetts also provides under law, free tuition for members of paid, call, and volunteer fire departments who enroll in fire science courses at a community college, state college, or university.

The second largest number of enrollments can be expected to be drawn from fire-related fields such as: oil and chemical corporations, industrial relations department personnel, insurance fields, equipment, and apparatus manufacturers and the volunteer fire service, which numbers some 1.25 million firefighters. The *Wall Street Journal* points out that volunteer firefighter organizations are hampered by shortages in qualified manpower and lack of technical education.

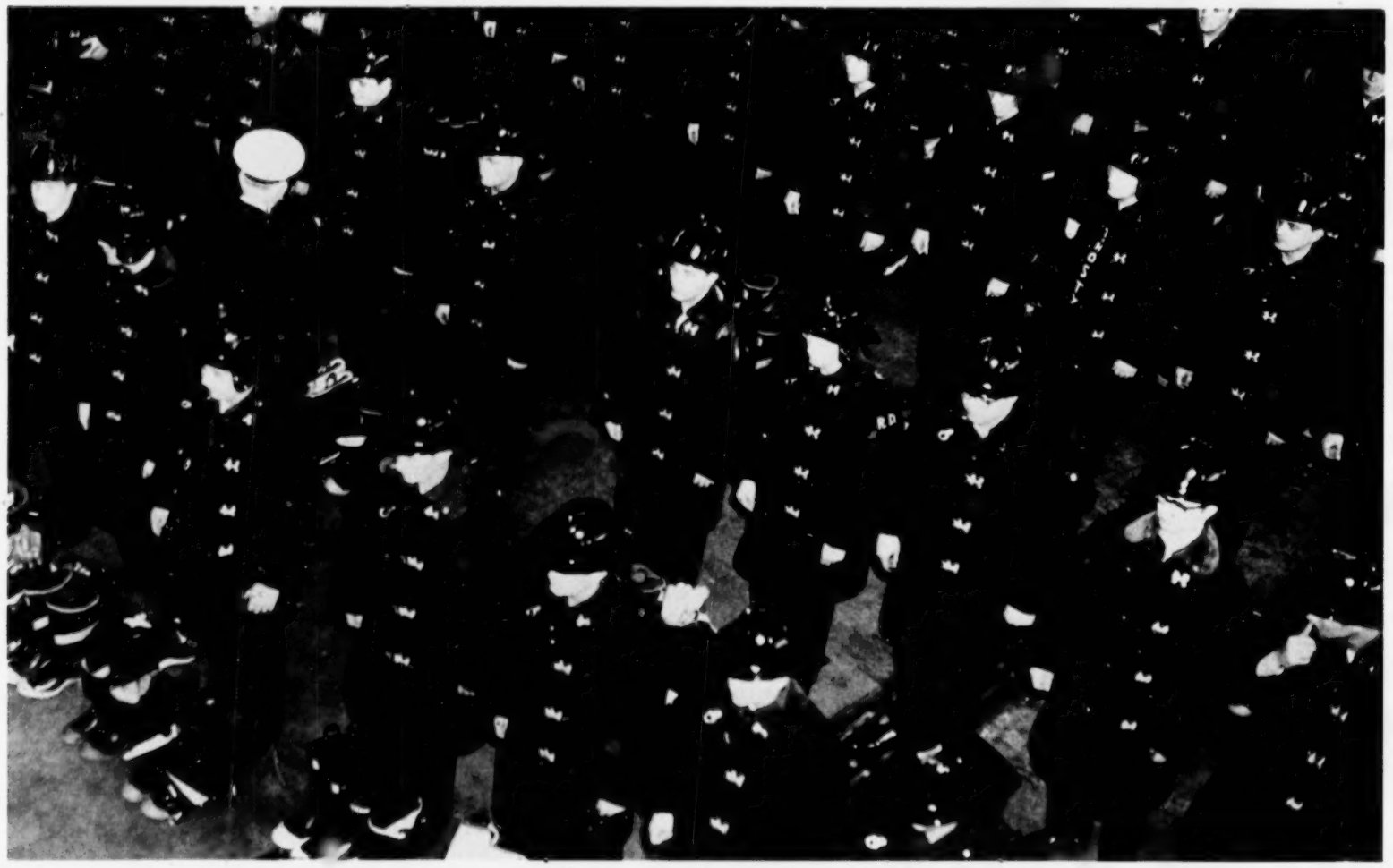
The number of preservice student enrollments may depend upon the success or failure of recruitment programs, and how much time is devoted by both fire service executives and faculty in contacting high school counselors and others who influence the career planning of preservice students.

The Fire Service Cadet

It has been known for some time that the fire service has been losing many potential career firefighters because of ineffective recruitment programs. To meet the manpower utilization challenge and recruitment competition an ever-growing number of fire departments are organizing fire service cadet programs.

The cadet program is designed to attract the high school graduates, aged seventeen to twenty-three, who may be interested in pursuing a firefighter career. Some of the more commonly cited advantages of the cadet system are:

* *Personal correspondence with the Dallas, Texas, Fire Department, July 1969.*



21

1. Long probation periods are in effect provided by the cadet system. This program makes it possible to determine if the cadet should continue to pursue a career in the fire service.

2. Regular sworn personnel are released from clerical and routine duties for assignment to basic firefighting duties.

3. When combined with a higher education program, the cadet system will produce a candidate for appointment to the department who is trained, has experience and demonstrates career potential.

The cadet program of the city of Chicago Fire Department is described in Appendix D.

The Bancroft Fire Protection District, a suburb of Denver, Colorado, has initiated an apprenticeship program to help solve its manpower problem. The program is designed for qualified high school graduates who are preparing to enter the labor market for initial entry into employment or advancement in municipalities, in industrial organizations, or in businesses requiring fire protection personnel. This is an example of positive manpower planning and is representative of the cooperative effort on the part of management and labor involving the Bureau of Apprenticeship and Training, the Colorado State Board for Community Colleges and Occupational Education, and the Colorado State Apprenticeship Council. The Colorado apprenticeship agreement is shown in Appendix E.

CHAPTER V

CURRICULUM PATTERNS

The Wingspread Conference addressed itself to the problem and definition of fire service professionalism in 1966. After reviewing the whole range, they offered a distillation which was succinctly stated: "Professional status begins with education" (9). Morris L. Cogan says, "A profession is a vocation whose practice is founded upon an understanding of the theoretical structure of some department of learning or science, and upon the abilities accompanying such understanding." He continues, "This understanding and these abilities are applied to the vital, practical affairs of man. The practices of the profession are modified by knowledge of a generalized nature and by the accumulated wisdom and experience of mankind, which serve to correct the errors of specialism. The profession, serving the vital needs of man, considers its first ethical imperative to be altruistic service to the client" (20:10).

The curriculum is the vehicle which brings the knowledge pertinent to a professional field to the student. The development of skills necessary for entrance-level jobs can be acquired through training. Training emphasizes memorization, imitation, and is oriented to things as they are. Education, however, emphasizes creative interaction and focuses on developing man's ability to think, listen, read, write, and speak critically. Judgment becomes the primary factor. The trained person knows the procedure and performs it according to fixed habit and standards. However, education prepares the student not only to ask how but adds the additional dimension of why. The trained person is comfortable in a familiar situation but experiences discomfiture and disorganization when fixed procedures fail to work. The educated person, on the other hand, is not uncomfortable in situations of uncertainty. Donald Holbrook says: "So let's face it, the fire service is big business and more education is needed, both technical and in the humanities, to enlarge the mental capacities of those who will find the answers to the problems brought by the requirements of today's world" (6).

Curriculum specifications are dependent upon the kinds of behavior expected as a result of the program. If those who complete the program are expected to have more than technical skills involved in firefighting, then the curriculum should include a broader educational base dealing with fundamental knowledge from which the applied skills emanate. The humanities, communication skills, physical sciences, and the social sciences are important in providing a general base from the program.

Lyndall F. Urwick points out: "We cannot do without theory. It will always defeat practice in the end for a quite simple reason. Practice is static. It does and does well what it knows. It has, however, no principle for dealing with what it doesn't know. . . . Practice is not well adapted for rapid adjustment to a changing environment. Theory is light-footed. It can adapt itself to changed circumstances, think out fresh combinations and possibilities, peer into the future" (18:10).

Alan F. Kiepper, city manager of Richmond, Virginia, sums up the value and necessity of liberal arts preparation for success in public service:

"I can't stress enough the broad nature of educational preparation. The higher one goes up the ladder of management, the more he must rely on the breadth of his education and experience. The man or woman trained in a narrow field will find that he or she is limited in his ability to handle greater responsibility" (15).

The Wingspread Conferees recommended that a systematic and deliberate educational program leading to a broad knowledge base be developed. It further noted that it is unrealistic to assume that every member of a fire department be a college graduate. The following chart from the Wingspread publication suggests a method of determining what levels of educational achievement should be considered (8:10).

A SUGGESTED CURRICULUM PATTERN

Fire Science Associate Degree Program

Professional Courses	Semester Hours	General Courses	Semester Hours
Fire Protection (introduction)	3	Communication Skills (written-oral)	6
Fire Suppression (introduction)	3	Mathematics (algebra)	6
Fire Prevention (introduction)	3	Science (physics-chemistry)	6
Fire Protection Systems	3	Psychology (general)	3
Fire Fighting Tactics and Strategy	3	Sociology	3
Building Construction	3	American Government (local, state, national)	3
Hazardous Materials	3	Elective	3
Fire Hydraulics and Equipment	3		
Electives	6		
	30		30

A SUGGESTED CURRICULUM PATTERN

Fire Science Certificate Program (30 credits)

Courses	Semester-Hour Credits
Introduction to Fire Protection	3
Introduction to Fire Suppression	3
Fundamentals of Fire Prevention	3
Fire Fighting Tactics and Strategy	3
Building Construction	3
Hazardous Materials	3
Fire Hydraulics and Equipment	3
	21
Communication Skills (written-oral)	3
Psychology (general)	3
Mathematics	3
	9
Total	30

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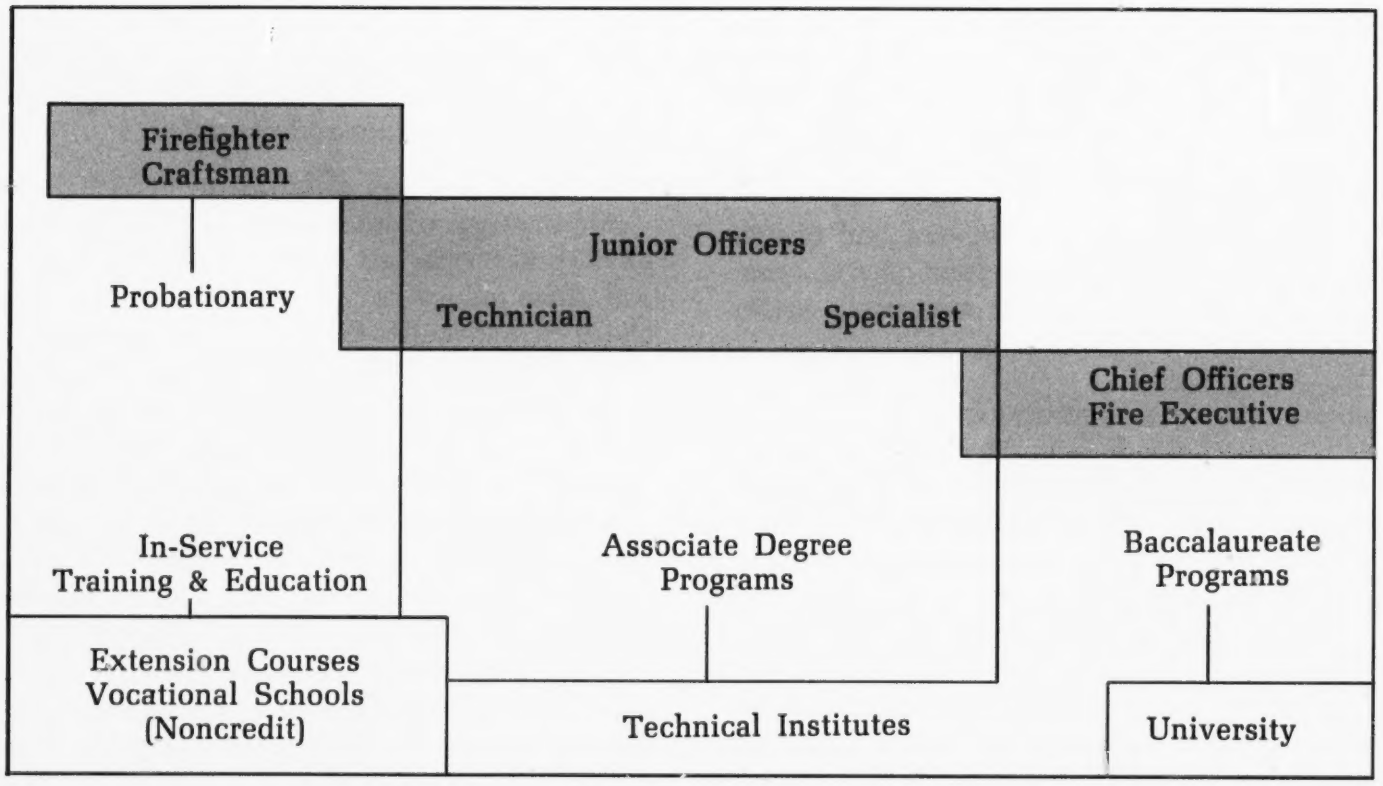
Figure VII: A MEANS OF ACHIEVING PROFESSIONAL EDUCATION



The 30-credit certificate program is most appropriate to the employed adult student who wishes the opportunity to pursue academic study in his career field, but who at this time may not be interested in the associate degree. A complete discussion of certificate programs and their importance to the adult returning to college is found in the *Guidelines for Law Enforcement Education Programs in Community and Junior Colleges* (3).

The general characteristics of the program become quite clear while the specifics will depend upon the nature of the incoming student, and the required behavior of the graduate. These will not be static but will require continuous evaluation. Rather than delineating the specific programs for each region, consensus is necessary in the general elements which will constitute the curriculum. The regional programs can be specified from the general requirements and relate to local concerns and needs.

As noted earlier in this publication, the community college is a flexible institution of higher learning. It not only offers studies in general education, but it also provides a rich offering of career-oriented programs as well as the opportunity for students of every age to pursue their individual educational interests during the day, the evening, weekends, or summers.

To earn an associate degree from a community or junior college requires matriculation and successful completion of a prescribed minimum of between 60 and 70 semester hours of study.

In addition to the associate degree program, certificate programs involving 30 semester hours of study can be developed to meet local specialized career needs.

FIRE SCIENCE ASSOCIATE DEGREE PROGRAM

PROFESSIONAL COURSE DESCRIPTIONS

Introduction to fire protection

History and philosophy of fire protection: review of statistics of loss of life and property by fire; introduction to agencies involved in fire protection; current legislative developments and career orientation; a discussion of current related problems, and review of expanding future fire protection problems.

Introduction to fire suppression

Survey of fire suppression organizations: basic elements of fire ground tactics and organization; manpower and equipment utilization; survey of building designs, construction, hazardous materials, extinguishing agents, equipment, and apparatus.

Introduction to fire prevention

Fire department organizations: inspections, public cooperation and image; recognition of fire hazards, development and implementation of a systematic and deliberate inspection program; survey of local, state, and national codes pertaining to fire prevention and related technology.

Building construction

Exploration of building construction and design with emphasis focused on fire protection concerns; review of related statutory and suggested guidelines both local and national in scope.

Fire fighting tactics and strategy

Efficient and effective utilization of manpower, equipment and apparatus. Emphasis will be placed on preplanning, fire ground organization problem solving related to fire ground decision making and attack tactics and strategy.

Fire protection systems

Study of the required standard for water supply; protection systems; automatic sprinklers and special extinguishing systems; including analysis of various automatic signaling and detection systems.

Hazardous materials

Study of chemical characteristics and reactions related to storage, transportation, handling hazardous materials, i.e., flammable liquids, combustible solids, oxidizing and corrosive materials and radioactive compounds. Emphasis on emergency situations and fire fighting and control.

Fire hydraulics and equipment

Application of the laws of mathematics and physics to properties of fluid states, force, pressure and flow velocities. Emphasis in applying principles of hydraulics to firefighting problems.

Special or individualized educational needs can best be met through the use of certain elective courses. For instance, officers with supervisory or command responsibilities should be encouraged to pursue electives in areas of supervision and management. On the other hand, the young student whose particular interests lean toward the industrial or insurance fields should be encouraged to pursue courses related to those special interests. For the former, a course in fire department organization and administration would be a must; for the latter, it might not be as pertinent.

SUGGESTED ELECTIVES

(Partial listing)

Professional

Fire Department Organization and Administration

Fire Causes and Detection (arson)

Legal Aspects of Fire Protection

Fire Safety Codes

Insurance Grading Schedules

Industrial Fire Protection

Emergency Rescue Operations

General

Fundamentals of Supervision

Training Methods and Procedures

Principles of Economics

Basic Computing Machines

Community and Public Relations

Fundamentals of Public Administration

Labor Management Relations

Public Speaking

Technical Report Writing

FIRE SCIENCE ELECTIVES
(PARTIAL LISTING)

COURSE DESCRIPTIONS

Fire causes and detection (arson)

The history, development and philosophy of fire investigation and detection, including inspection techniques; gathering of evidence and development of technical reports; fundamentals of arson investigation, processing of criminal evidence and criminal procedures related to various local and state statutes.

Fire department organization and administration

An exploration of organization principles with emphasis on fire department organization; a study of the history, types, methods and principles of fire department organization, both formal and informal, line and staff. Emphasis placed on supervisory responsibilities and functions.

Legal aspects of fire protection

A study of legal rights and duties, liability concerns and responsibilities of the fire department organizations while carrying out their duties.

Fire safety codes

A study of the history, development of codes, emphasis placed on the nature and scope of legal statutes and related codes in fire protection control.

Insurance grading schedules

A study of grading schedules, including the analytic and mercantile schedules, a survey of methods employed to determine fire rating and classifications. Emphasis placed on specific line insurance, policies, selection, rate determination, claim adjustments, risks and the self-insured.

Industrial fire protection

Emphasis on specific concerns and safeguards related to business and industrial organizations. A study of industrial fire brigades, fire prevention programs, their organization and development. Gaining cooperation between the public and private fire department organization, community relations responsibilities.

Emergency rescue operations

Exploration of the underlying basic science, recognizable conditions and its emergency management. Topics of discussion include: control of hemorrhage, cadeo-pulmonary resuscitation, fractures, burn victims, poisoning by drugs, chemicals, gases, and snake and insect bites, childbirth, transportation of patients.

Laboratory facilities

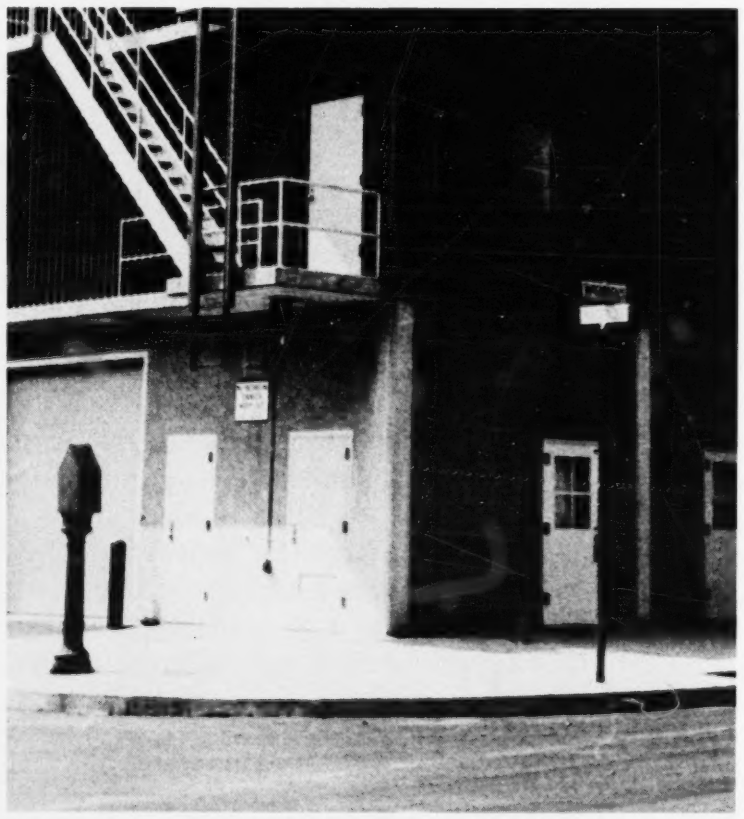
In communities where the junior college is in close proximity to a fire service training center, exceptional opportunities exist to benefit fire service education and training programs.

Few junior colleges are equipped with model fire protection and detection systems, alarm systems, cut-away pumps, and other sophisticated devices common to a fire service training center's laboratory. Such a facility is invaluable in augmenting special courses offered by the junior college. A cooperative arrangement between the college and the training center should be considered to make these learning aids available to junior college classes. Administrators of the training center and the junior college might further determine areas of shared responsibility in presenting their overall training and educational programs.

It would seem valid for the training center to concentrate its efforts on developing and perfecting the vocational/manipulative skills such as standard evaluations, basic fire ground operations, pump and ladder drill, etc. The junior college would then be responsible for development and presentation of theory and the body of knowledge which is the foundation of good fire protection operation and management.

The Fire Department Training Center at Dayton, Ohio, is an example of such a facility. It consists of the following:

1. Environmental Building: This is a building designed for the express purpose of simulating the



physical environment of fire emergencies while retaining a safe working condition for participating firemen.

The building which includes architectural examples of most major type buildings, designs, and occupancies, is a concrete, high-intensity fire building, rising from an 18-foot sidewalk, through a variety of levels, floor plans, and roof structures to the top of a six-story stairwell. The first floor is 40 feet by 76.5 feet. Each higher floor decreases in size. Total floor space is approximately 10,000 square feet. Basic spacing of columns is about 13 feet providing possibility of making rooms of this size.

Atmospheres of heat and smoke can be created by actual free burning of combustible materials or be controlled by the use of an incinerator and a million B.T.U. heating unit. Smoke and heat are ducted to four floors where the amount and kind of smoke and temperature can be regulated.

Replaceable panels in roofs and floors, attic spaces, wet or dry sprinkler systems, fire doors,

suspended and replaceable ceiling for hidden fires, vertical and horizontal openings, and an above-ground simulated basement add to the versatility and realism for modern fire training.

Provisions for quickly evacuating personnel and dumping smoke and heat from the structure have been provided.

Outside of the building the asphalt streets, hydrants, signs, marquee, trolley wires, and firebox are aides in setting up typical fire ground conditions.

A drafting pit is under one of the streets. Nearby concrete pads are equipped with hardware to hold master and hand-line stream nozzles when pumping is the prime consideration in practice. A 50-foot pit is provided for flammable liquid fire practice.

2. Fire Training Center Classroom Building: The one-story brick building located on seven acres of ground (see Figure IX) was designed with restraint and within the realm of reasonable economy, but also with a high regard for materials of lasting quality and consideration of low maintenance. A highly functional plan, resolved to its simplest form, will allow expansion of training center activity.

Paved streets simulate city blocks for driving practice and realistic placing of fire apparatus during exercises at the fire building, drafting cistern, and burning pit. Blaze Street leads to the lighted, black-topped forty-car parking lot in the rear of the classrooms.

The classroom and drill hall areas can be varied in number and size of rooms from one 2,500 square-foot auditorium to two lecture rooms and a drill hall. This is done by arrangement of hard-panel, acoustical folding walls. Firefighting equipment can be brought into the hall through overhead garage doors at either end and demonstrations can be viewed by students seated at their desks. There are no windows in this area. Training aids which require dim light or darkness can be used without shades or drapes.

Air-conditioning and mechanical ventilation provide necessary comfort. Combined with adequate lighting and the harmonizing eye-appealing color scheme, a pleasing and enhancing environment for teaching and learning is gained.

Offices are attractive and functional. A conference room adjoins the office of the drillmaster. Storage space is sufficient. Tiled shower and locker rooms and other sanitary facilities, together with a small kitchenette, give personal convenience.

A sophisticated telephone and paging system allows excellent intercommunication throughout the building and the entire center. This system is connected to the fire department alarm and communication complex.

3. Controlled Laboratory Conditions: Realizing the potential hazard to personnel produced by actual fires and the need for research in fire extinguishment, a system for recording temperatures and analyzing gases resulting from fire has been incorporated.

An adaptable recording system has been designed for and installed in the physical environmental building. Temperature can be measured and recorded at any area and at any height in the building. Six fixed thermocouples are at three levels in the high-intensity fire room. Flexible cables encasing type K thermocouple wire can be attached to any of thirty-six sockets in the building and stretched to desired spots. The wire is protected by a chromelalumel sheath and unimpregnated glass affording protection up to 2,000 degrees Fahrenheit.

Recording is done in a small, glass-front recording building across a street from the environmental building. A console and multipoint recorder were made by Barber Coleman, Inc. (see Figure X). Temperature at one to twelve points in the environmental building can be recorded in quickly repeated sequence and identified on a chart by color and number. These points to be recorded are selected by patch cords and switches on the console. Recorder temperature range is 0 degrees to 2,000 degrees Fahrenheit.

Some sockets in the environmental building, are arranged to connect thermocouple control cables to regulate the temperature in areas heated by the fire-simulating furnace. A recording is made of these temperatures.

The percentage of carbon monoxide, carbon dioxide, and oxygen can be determined and recorded. Samples of the atmosphere are pumped to analyzers made by Beckman Instruments, Inc. Five flexible tubes can be connected and placed at strategic locations. Sample flow is controlled by valves operated by an automatic selector switch. Analysis of the three gases is made simultaneously from each of one to five samples taken in sequence.

An electrical signal is transmitted to recorders in the console in the recording building. Barber Coleman, solid-state, strip recorders make separate records of percentage of each gas on a chart.

The oxygen analysis is capable of indicating 0 to 100 per cent, 0 to 25 per cent or 0 to 5 percent of oxygen. The infra-red carbon monoxide analyzer reads 0 to 10 per cent. The infra-red carbon dioxide analyzer is designed to show 0 to 20 per cent with provision to change to 0 to 10 per cent.

CHAPTER VI

PROGRAM DEVELOPMENT AND IMPLEMENTATION

The scope of higher education instruction, research, and service has expanded more since World War II than during any previous twenty-five-year period.

Generally, courses of study and curriculum in institutions of higher learning require a basis in theory and employ a teaching method which calls upon the intellective processes by emphasizing creative interaction, i.e., critical listening, speaking, reading, writing, visualizing, and observing. Judgment, not memory, becomes central.

Recognition and specification of the theoretical base and emphasis upon competence in the creative interaction order have been sought by academicians in the proposals and materials presented by those who wish academic sponsorship.

Faculties of institutions of higher education seldom will compromise in their expectation to have degree-holding instructors responsible for courses recognized as of collegiate quality. This requirement protects both the quality of the program and in the final analysis, the student.

Another major concern of the administration is about the nature of the clientele to be served. After the Second World War, higher-educational institutions found that thousands of G.I.'s who had not finished high school could qualify for college attendance by examination. Since then, most institutions have accepted a variety of alternatives to diplomas granted for high school attendance. The route is open. However, this does not mean that higher educational institutions are willing to accept those with less than capacity to do the intellective tasks traditionally required. Programs are consequently examined in terms of what clientele is considered in the resource pool and evidence is requested with respect to the ability of prospective students to compete in studentship with those registered in other programs offered. With this naturally goes the question of the extent and of the continued sufficiency of the resource pool. Some institutions have offered courses, employed instructors, and developed courses and materials only to find that the promised volume of ambitious students was not forthcoming. A vehicle which prevents this kind of unfortunate situation from occurring is the fire science advisory committee.

The Fire Science Advisory Committee

Considerable care should be exercised in setting up the fire science advisory committee (14) as the success of any fire science program will depend largely on the contributions of this body. The role of the advisory committee is to prov de dynamic guidelines for developing and maintaining the fire science program. Members of the committee should be carefully selected from the community and should be individuals who are qualified to provide a wide spectrum of related occupational information to the college administrator and faculty in program planning. Some specific committee functions are:

1. Serves as a communication link between the college and local and national fire-oriented organizations, e.g., International Association of Fire Chiefs, International Fire Administration Institute, International Association of Fire Fighters, National Fire Protection Association, Fire Equipment Manufacturers Association, International City Managers Association and National League of Cities, to name several.
2. Conducts a systematic survey of the community to ascertain both immediate and long-range fire science educational needs. The scope of the survey should cover an area within realistic commuting distance.
3. Assists in recruiting personnel from business and industry; selects competent lecturers and instructors who are academically acceptable to the college and are knowledgeable in firematics.
4. Identifies and recommends a systematic body of technical knowledge to be utilized in the instructional pursuit of the educational objective. Evaluates instruction against performance standards in relationship to program objectives. The realistic evaluation of the program's success is the extent to which its graduates achieve self-realization.
5. Keeps college administration informed of changes in the labor market. Accumulates statistical evidence related to knowledge requirements and occupational skills which are presently and likely to be essential to those graduates responsible for safeguarding the health, safety, and welfare of the community.
6. Assists in recruiting of potential students, counseling, the job placement of program graduates, follow-up studies of graduates, develops rapport and maintains liaison with high school administrators and official bodies and units vested with responsibility for setting employment qualifications, establishing certification and personnel recruitment and selection.
7. Recommends and suggests methods toward improving the public image of the program and its

graduates. Participates in "Career Day," "Open-House," and "Fire Prevention Week" activities in the school, college, and community. Arranges for publicity of fire science or related activities through the several news media.

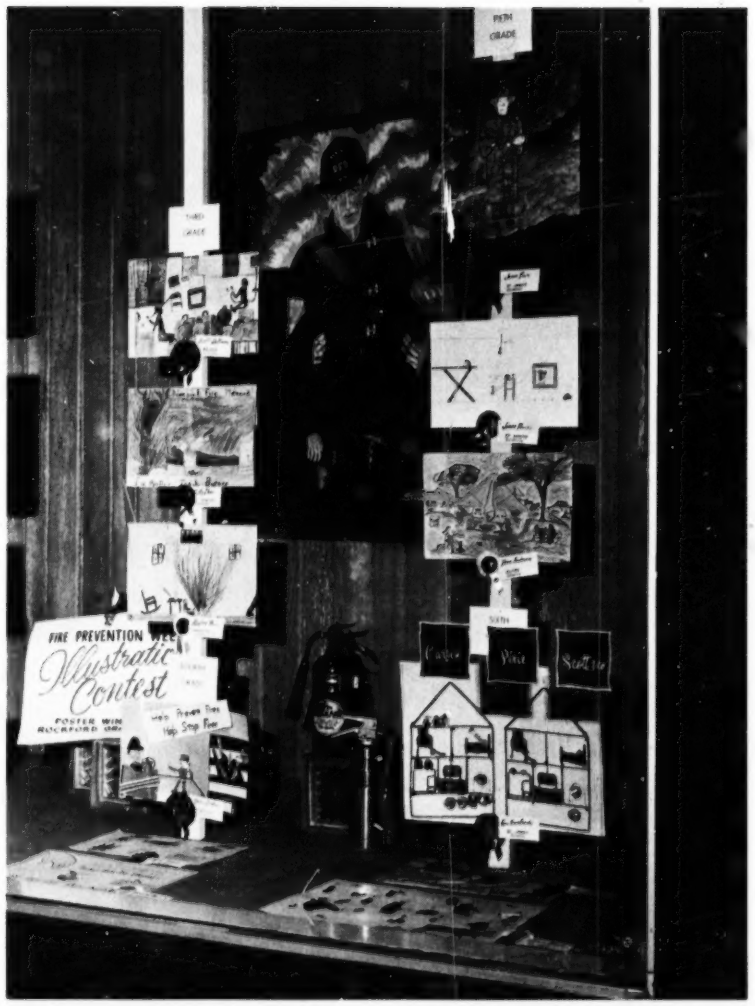
8. The committee can provide invaluable expertise to the college administrator in establishing standards for equipment, facilities, and instructional material for the fire science program.

9. The committee may raise scholarships to provide incentives and motivate both the career and volunteer firefighter to enroll for the program, as well as to respond to financial needs of high school graduates.

10. Depending upon the stage of the program, the fire advisory committee might meet as often as monthly or as seldom as twice a year. However, members should be available for informal consultations as the need arises.

It is strongly recommended that the committee be comprised of not more than fifteen or less than six active community leaders. Committees larger than fifteen are unwieldy and cumbersome. It is, however, essential to include several fire department executives. The remainder of the committee should represent business, industry, labor, education, local, or state government. In the program's best interest, each committee member should be chosen for his willingness (time commitments) and competency to contribute significantly to a dynamic fire science program. Advisory committee members should be appointed for a definite term of office, serving from one to three years. Provision should be made for staggered replacements to insure that there are always experienced members serving.

When a term expires, a new committee member should be appointed. The college should have an option, however, to request members to be reappointed for a new term.



Resources for assistance in program development

The International Fire Administration Institute, affiliated with the State University of New York at Albany, chartered by the New York State Board of Regents and sponsored by the International Association of Fire Chiefs, provides assistance to the nation's fire departments and institutions of higher learning through the many services rendered by its staff of consultants.

The objectives of the Institute are:

1. To engage in research and otherwise obtain material for the preparation of courses of study in fire administration and related subjects and to prepare such courses of study

2. To make such material and courses of study in fire service administration and related subjects available for use by educational institutions, particularly at the college level, in the United States and foreign countries, and to work with and assist educational institutions in the development of such material

3. To give assistance by grants or scholarships to students in the field of fire administration; and to receive funds, grants and gifts for carrying out the objectives of the Institute.

By requesting assistance from the I.F.A.I., interested administrators may also obtain names of consultants who are qualified to offer assistance in curriculum, facilities, and program development.

The American Association of Junior Colleges provides consultative services to community colleges, as well as to universities interested in offering upper-division study for transfer students. The W. K. Kellogg Foundation grant to AAJC has enabled the Association to establish a national fire science advisory council and develop this publication.

There are other organizations that have related material available and whose interests pertain to fire science research, education and training. These agencies are listed below:

International Association of Fire Chiefs
232 Madison Avenue
New York, New York 10016

Committee on Fire Research
National Academy of Sciences
National Research Council
Washington, D. C.

National Fire Protection Association
60 Batterymarch Street
Boston, Massachusetts 02110

Institute for Training in Municipal Administration
International City Managers Association
1313 East 60 Street
Chicago, Illinois 60637

International Association of Fire Fighters
905 16th Street, N.W.
Washington, D. C. 20006

Society of Fire Protection Engineers
60 Batterymarch Street
Boston, Massachusetts 02110

Fire Protection Research International
Fitzwilliam, New Hampshire 03465

American Insurance Association
110 William Street
New York, New York 10038

Institution of Fire Engineers
137 East Wilson Street
Madison, Wisconsin 53703

International Society of Fire Service Instructors
Box 382
College Park, Maryland

For a complete roster of state fire marshals and state training supervisors, see Appendices F and G.

Community Relations

Program information and community relations (3:28) for a new educational offering must be an essential part of planning and organization. Since many new occupational programs are developing in community colleges, they must be continually explained, promoted, and publicized to the community. Community relations and promotion is a never-ending process of education aimed at winning the acceptance, approval, and support of the fire service profession and the total community. It is particularly important that potential fire science students become aware of the fire science program so that they may avail themselves of its opportunities. Following are some suggested methods of community relations and promotion that have been successfully used in developing occupational programs in the community college.

Brochures

An attractive brochure is an essential vehicle for the dissemination of information to students, parents, fire executives, guidance counselors, and other persons interested in the fire science program. It should contain information dealing with the scope of the program, various career opportunities, employment standards, and the challenge of modern fire service. Additionally, the brochure should give specific information concerning the nature of the fire science program, types of courses offered, and some explanation of the course objectives. Pictures of students and firefighters in the classroom or at the fire ground training laboratory will stimulate interest and help to describe the program. The theme of the brochure should be the advantages of a fire service career and should not be confined to a simple exposition of program content and entrance requirements.

If scholarships or other financial aids are available through the community college or outside sources, refer to these sources in the brochure. College fees, where required, will also be of interest to potential students and their parents.

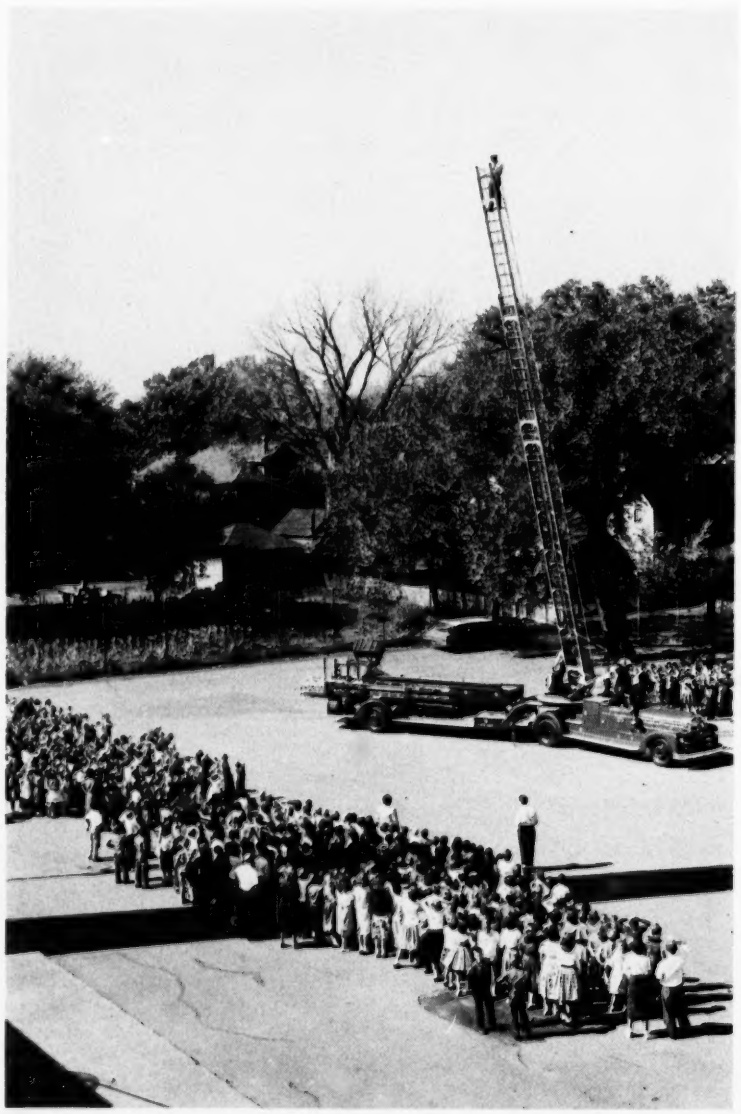
Bulletin Board

Various kinds of school or commercial displays are excellent attention-getters for the fire science program. Items of fire equipment effectively presented are appropriate for use on the college campus, in the high schools, and in the community. Next in appeal to actual exhibits of equipment are attractive and interesting school bulletin boards. Colorful posters and bulletin board displays can serve the dual purposes of stimulating firefighter recruitment and promoting the college program. Fire Prevention Week provides an excellent opportunity to educate the public on the entire scope of fire protection.

Professional Meetings

Fire service organizations hold regular meetings of varying degrees of formality. Such meetings and related social activities provide the program director with one of his most valuable opportunities to develop close working relationships with fire service executives and firefighters. Whether or not the director appears on the formal program, he should attempt to attend a number of the meetings held by fire departments. Sufficient funds should be included in the program budget to encourage and facilitate attendance at these meetings and conferences.

The community college should not overlook the possibility of hosting professional meetings to give fire protection personnel an opportunity to visit the college facilities and meet with fire science staff. Such visits also permit fire executives to meet with students to discuss employment possibilities and other matters of mutual interest.



Community College Paper

Most community colleges have a periodical for publishing news items concerning curricular activities and other events. Not only can this medium promote the fire science program within the college, but also within the community. The potential of on-campus recruitment should not be ignored. Many students enrolled in other programs may be dissatisfied with their major and will consider transfer into the fire science program when they become aware of its opportunities.

Local News Media

The local newspaper, radio, and television stations are usually interested in receiving news pictures of occupational program activities. The college public or community relations director should be furnished with materials and information for this kind of publicity. The program director and his staff can expect to receive requests for television interviews, ranging from short news spots to participation in public information panel shows. Each exposure will benefit the fire science program and the college.

Field Trips

Field trips to fire departments are an effective way of exposing students to the professional field and introducing them to fire service personnel. Such trips supplement and enrich regular classroom instruction and should be designed primarily as learning experiences for the student, without overlooking the program publicity benefits.

Other Activities

The program director and faculty should be constantly alert to other public information activities that help publicize the fire service profession and the education program. Membership in, or appearance on the programs of civic organizations will enable the program staff to present valuable information to influential citizens of the community. The public information focus should combine emphasis on the advantages and challenges of careers in modern fire protection with the importance of adequate educational preparation.

CHAPTER VII

EMPLOYMENT FOR THE JOBLESS

Manpower Waste

As the "civil rights movement" has gained momentum into the "freedom movement," the public and private sectors find themselves the object of increasing demands for jobs by unemployed and underemployed Negroes and other minorities.

Socioeconomic problems involving these individuals with cultural, and/or educational limitations sufficient to impair employment has generated many new words, e.g., minority, disadvantaged, disenchanted, underemployed, and hard-core unemployed, to describe a manpower resource numbering in the thousands.

Research indicates that this pool of untrained and unskilled people need only the encouragement, proper motivation, and an opportunity to make a valuable contribution to society. The public and private sectors of society have joined together for the purpose of developing and implementing viable action-oriented job training programs.

The Seattle Program

In April, 1968, the city of Seattle, Washington, took an innovative step to create permanent civil service employment for the "hard-core" unemployables, through an "earn-as-you-learn job training program." The candidates were selected under the direction of the Civil Service Department. Applicants were not required to have a high school diploma or pass the conventional civil service examination. However, trainees who were to be assigned to the police and fire departments were required to pass the medical examination prescribed for all civil service appointees to these agencies. Applicants are interviewed by a fire department staff officer and are also given an extensive background investigation required of all candidates for appointment to the fire department.

It was necessary for trainees hired under the program to meet one or more of the following criteria:

1. Be a member of a poor family as defined by the U.S. Department of Labor
2. Be unemployed
3. Be underemployed
4. Be handicapped by educational deficiency, or chronic conditions which could limit work activities, but which can probably be overcome during a training period up to four years.

The trainee's starting salary is $488 per month. For the first seven weeks in the program, he receives instruction identical to that of a civil service probationary firefighter. When this phase of training is completed, the trainee enters into a split schedule, receiving additional firematic training and begins the educational phase aimed at correcting academic deficiencies.

The educational program is conducted by the Seattle Community College. The trainee is graded on his firematic training by the fire department, and the community college grades the educational phase of the program. The objective of the educational phase of the program is to prepare the trainee to write the examination for permanent civil service appointment.

After one year, the Seattle fire chief reports that the program is firmly entrenched as part of the normal employment process. Three of the original group of candidates have overcome their academic deficiencies, passed the civil service examination, and successfully completed the required six-month probationary period and moved into the regular rank. Other trainees are expected to follow the same pattern.

The "Seattle Story" is an example of innovative leadership and also demonstrates what can be done through the cooperative efforts of local government and a community college.

CHAPTER VIII

SUMMARY

We live in an age of rapid change and obsolescence. Our national economic growth and well-being are dependent upon basic research and technology, and upon the higher skills needed to make this new technology effective. The equipment in our places of work and homes becomes obsolete with increasing rapidity and is replaced with newer, more efficient, sophisticated, and versatile models.

In a similar manner and for similar reasons organization men grow obsolete at an equally alarming rate.

Cornell Professor Earl Brooks coined the acronym "POPO" to describe organization men who are no longer able to perform their jobs in a satisfactory manner; they reach a performance plateau and become POPO's, i.e., Promising Once, Presently Obsolete; Permanently Overlooked, Pasture Only; Promotions Over, Pension Objective; and Passed Over, Plenty Often.

To avoid the POPO dilemma, one must realize early in his career that what he learned in high school or college will not last him a lifetime, and take positive action to enhance his educational posture by updating himself continually.

These guidelines are not to be considered the panacea for achieving professionalism. It is the author's hope that this examination of identifiable characteristics of the fire service profession, coupled with a realistic manpower outlook, will provide an avenue of approach for program development and implementation to meet the obsolescence challenge of the 1970's.

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APPENDIX A

REQUIREMENTS

Entrance Requirements: Applicants must have a high school diploma and an A.A. Degree in Fire Science, although sixty units of college work approved by the department may be substituted for the A.A. Degree. All applicants must be United States citizens. California residence is not required to take the exam.

Age Limits: 21 through 32 years of age.

Police Record: Applications will not be accepted from persons who have been convicted of a felony.

Physical Requirements: Sound physical condition, endurance, strength, and agility; height not less than 5 feet 8 inches and not more than 6 feet 4 inches; waist measurement not to exceed the measurement of the chest in repose; weight proportional to age and height; good health and freedom from disabling defects; normal visual function and acuity not less than 20/20 in each eye without correction; normal color vision; and normal hearing. Height and weight standards are shown on the reverse of this announcement.

CAUTION: IF YOU CANNOT MEET ALL THE STATED REQUIREMENTS, YOU ARE URGED NOT TO APPLY FOR THIS EXAMINATION AS NO EXCEPTIONS CAN BE MADE.

THE EXAMINATION

The Written Test: A three-part written test will be given consisting of a general intelligence test, a test on math and grammar skills, and an entrance level Fire Fighters Aptitude Exam. Candidates must receive a passing score on all tests to be eligible for the physical performance test.

Physical Performance Test: This part of the exam will be a test of strength, agility, and endurance. See reverse side for more details.

Date of Test: Both the written exam and performance test will be administered on Saturday, November 16, 1968. Candidates who are accepted for the exam will be notified by mail as to the time and place.

The Personal Interview: An oral interview board will evaluate the personal traits, education, and experience of the candidates. This evaluation will include a detailed background check of past employment and military record. Desirable qualifications include: neat personal appearance; willingness to work under strict discipline; integrity, reliability, resourcefulness, courtesy and good judgment; and ability to get along well with others. The date of the personal interview will be announced.

SALARY RANGE

The salary range upon appointment is $657 with advancement to $690 upon completion of a six months probationary period. The top step of the range is $799. The salary range for persons with a B.A. or B.S. Degree is $690-839.

HOW TO APPLY

Applications may be obtained from Headquarters Fire Station, 185 East Santa Clara Street, Ventura, or from any of the other three fire stations around town, or from City Hall, 625 East Santa Clara Street.

APPENDIX B

INSTITUTIONS OFFERING FIRE SCIENCE DEGREE PROGRAMS IN THE UNITED STATES

ARIZONA

Phoenix College

CALIFORNIA

Allan Hancock College
American River College
Antelope Valley College
Bakersfield College
Butte Junior College
Cabrillo College
Cerritos College
Chabot College
Chaffey College
City College of San Francisco
College of the Desert
College of Marin
College of the Redwoods
College of San Mateo
College of the Sequoias
Columbia Junior College
Compton College
Cuesta College
Diablo Valley College
East Los Angeles College
El Camino College
Fresno City College
Glendale College
Hartnell College
Imperial Valley College
Long Beach City College
Los Angeles Harbor College
Los Angeles Valley College
Merced College
Miracosta College
Modesto Junior College
Monterey Peninsula College
Mt. San Antonio College
Mt. San Jacinto College
Napa Junior College
Ohlone College
Palomar College
Pasadena City College
Peralta Colleges
Rio Hondo Junior College
Riverside City College
San Bernardino Valley College
San Diego City College
San Joaquin Delta College
San Jose City College
Santa Ana College
Santa Barbara City College
Santa Monica City College
Santa Rosa Junior College
Shasta College
Sierra College
Solano County Junior College
Ventura College
Victor Valley College
Yuba College

COLORADO

Aims College
Community College of Denver
El Paso Community College

CONNECTICUT

Bullard Technical School
Eli Whitney Technical School
Hartford State Technical College
Henry Abbott Technical School
Norwalk State Technical College
Norwich State Technical Institute
Thames Valley State Technical College
Waterbury State Technical College

DISTRICT OF COLUMBIA

Washington Technical Institute

FLORIDA

Florida Junior College at Jacksonville
Miami-Dade Junior College
St. Petersburg Junior College

HAWAII

Honolulu Community College

ILLINOIS

Black Hawk College
Carl Sandburg Community College
College of DuPage
Illinois Institute of Technology
Moraine Valley Community College
Rock Valley College
William Rainey Harper College

LOUISIANA

Delgado College

MARYLAND

Anne Arundel Community College
Baltimore Community College
Catonsville Community College
Montgomery Community College
Prince George's Community College
University of Maryland

MASSACHUSETTS

Bristol Community College
Greenfield Community College
Massachusetts Bay Community College
North Shore Community College
Quinsigamond Community College
Springfield Technical College

MICHIGAN

Flint Community College
Lansing Community College
Macomb County Community College
Muskegon Community College
St. Clair County Community College
Washtenaw Community College

MINNESOTA

Metropolitan State Junior College

MISSOURI

Forest Park Commuuity College
Metropolitan Junior College

NEBRASKA

Central Nebraska Vocational Technical School

NEVADA

Southern Nevada University

NEW JERSEY

Jersey City State College
Newark College of Engineering

NEW YORK

Auburn Community College
Erie County Community College
Monroe County Community College
New York City Community College
Onondaga Community College
State University at Farmingdale
Suffolk County Community College
Westchester Community College

NORTH CAROLINA

Central Piedmont Community College
Guilford Technical Institute
Richmond Technical Institute
Rowan Technical Institute

OHIO

Cuyahoga Community College
Sinclair Community College

OKLAHOMA

Oklahoma State University

OREGON

Lane Community College
Portland Community College
Salem Technical Vocational Community College

PENNSYLVANIA

Community College of Allegheny County
Community College of Delaware County
Philadelphia Community College

RHODE ISLAND

Rhode Island Junior College

TEXAS

Dallas County Junior College
El Centro Junior College
San Antonio College
San Jacinto Junior College
South Texas Junior College
Tarrant County Junior College

UTAH

Utah Technical College

VIRGINIA

Northern Virginia Community College

WASHINGTON

Big Bend Community College
Clark College
Seattle Community College
Spokane Community College
Tacoma Vocational Technical College

WISCONSIN

Madison Area Technical College
Milwaukee Technical College
Racine Technical Institute

APPENDIX B

NUMBER OF FIRE SCIENCE DEGREE PROGRAMS AVAILABLE IN THE UNITED STATES AND OUTLYING AREAS

1969

	Associate degree programs (two-year)	Baccalaureate degree programs (four-year)	Master's degree programs	Number of separate institutions
Alabama	0	0	0	0
Alaska	0	0	0	0
Arizona	1	0	0	1
Arkansas	0	0	0	0
California	35	0	0	55
Colorado	3	0	0	3
Connecticut	8	0	0	8
Delaware	1	0	0	1
Dist. of Columbia	1	0	0	1
Florida	3	0	0	3
Georgia	0	0	0	0
Hawaii	1	0	0	1
Idaho	0	0	0	0
Illinois	6	1	0	7
Indiana	0	0	0	0
Iowa	0	0	0	0
Kansas	0	0	0	0
Kentucky	0	0	0	0
Louisiana	1	0	0	1
Maine	0	0	0	0
Maryland	5	1	0	6
Massachusetts	6	0	0	6
Michigan	6	0	0	6
Minnesota	1	0	0	1
Mississippi	0	0	0	0
Missouri	2	0	0	2
Montana	0	0	0	0
Nebraska	1	0	0	1

	Associate degree programs (two-year)	Baccalaureate degree programs (four-year)	Master's degree programs	Number of separate institutions
Nevada	1	0	0	1
New Hampshire	0	0	0	0
New Jersey	2	0	0	2
New Mexico	0	0	0	0
New York	8	0	0	8
North Carolina	4	0	0	4
North Dakota	0	0	0	0
Ohio	2	0	0	2
Oklahoma	1	0	0	1
Oregon	3	0	0	3
Pennsylvania	3	0	0	3
Rhode Island	1	0	0	1
South Carolina	0	0	0	0
South Dakota	0	0	0	0
Tennessee	0	0	0	0
Texas	6	0	0	6
Utah	1	0	0	1
Vermont	0	0	0	0
Virginia	1	0	0	1
Washington	5	0	0	5
West Virginia	0	0	0	0
Wisconsin	3	0	0	3
Wyoming	0	0	0	0
Guam	0	0	0	0
Virgin Islands	0	0	0	0
Totals:	142	2	0	144

APPENDIX C

APPENDIX C

File No. 1375

Substitute for House Bill No. 7351

State of Connecticut

HOUSE OF REPRESENTATIVES

House of Representatives, May 26, 1969. The Committee on Cities and Boroughs reported through Rep. Palmieri of the 90th District, Chairman of the Committee on the part of the House, that the substitute bill ought to pass.

AN ACT REQUIRING MUNICIPALITIES TO REIMBURSE FIREMEN AND VOLUNTEER FIREMEN FOR TUITION AND TEXTBOOK COSTS FOR COURSES IN FIRE TECHNOLOGY AND ADMINISTRATION.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. Any town, city or borough subject to the approval of its legislative body, shall indemnify any paid or volunteer member of its fire department who, after October 1, 1969, has commenced and has successfully completed a course or courses in fire technology and administration offered by the state technical colleges. Such indemnification shall be limited to expenses incurred by such member for tuition and textbook charges.

Sec. 2. This act shall not apply to any member of a fire department of a town, city or borough receiving educational benefits from the veterans administration or any Connecticut fire department association.

APPENDIX D

CHICAGO FIRE DEPARTMENT CADET PROGRAM

POSITION OF FULL-TIME FIRE CADET

THIS POSITION REQUIRES:

Full-time employment (40 hours per week) as a fire cadet.

SALARY:

$4,848 annual salary—first 6 months
$5,088 annual salary—next 12 months
$5,340 annual salary—next 12 months
$5,604 annual salary—next 12 months

BENEFITS:

11 paid holidays each year
12 paid sick days each year
2-week vacation with pay each year

POSITION OF PART-TIME FIRE CADET

THIS POSITION REQUIRES:

Part-time employment (20 hours per week) as a fire cadet. Enrollment as a student, at a local educational facility, is desirable but not required.

SALARY:

$2.38 per hour—first 6 months
$2.49 per hour—next 12 months
$2.62 per hour—next 12 months
$2.75 per hour—next 12 months

BASIC QUALIFICATIONS FOR BOTH OF THE ABOVE POSITIONS

1. AGE—17 and not yet 23 at time of application or on the Civil Service list for Firefighter.
2. HEIGHT—5 feet 7 inches barefooted (minimum).
3. WEIGHT—130 pounds (minimum) and up proportionate to height.
4. VISION—At least 20/40 each eye uncorrected. 20/20 both eyes corrected.
5. Must pass thorough medical examination and physical fitness tests.
6. Good reputation and high moral character.
7. Above average in mental ability.
8. Must be a resident of Chicago.
9. Must be a citizen of the United States.

APPENDIX E

TRAINING STANDARDS for FIRE FIGHTERS

Formulated by the BANCROFT FIRE PROTECTION DISTRICT Denver, Colorado

Working in Cooperation with the Bureau of Apprenticeship and Training U.S. Department of Labor

The future security and progress of the Bancroft Fire Protection District depends upon an adequate supply of qualified Fire Fighters possessed of the necessary high skills to perform properly the processes of the craft.

The recognized method of developing such Fire Fighters is apprenticeship. Therefore, a system of apprenticeship embodying the fundamental principles which will insure proper training of apprentices will constitute the best guarantee that the industry will have an adequate flow of young men into the craft. Such a system must provide full opportunity for the apprentice to acquire the necessary skills of the craft and at the same time impress upon him the opportunities available to him through planned apprenticeship as well as his responsibilities to the industry which he has chosen.

To accomplish these objectives, Fire Fighters Local Union #1528 and the Bancroft Fire Protection District in this industry in Denver have jointly resolved to establish these apprenticeship standards, recognizing that each must render full cooperation in order that the apprenticeship system may be efficient and effective.

APPENDIX F

STATE FIRE MARSHALS

ALABAMA:

J. B. Kitchens, Department of Insurance, 400 State Administrative Bldg., Montgomery, Alabama 36104

ALASKA:

Wallace W. Dawson, Pouch "N", State Capitol Building, Juneau, Alaska 99801

ARIZONA:

T. M. Humphrey, Commissioner of Public Building Safety, 718 West Glenrosa, Phoenix, Arizona

ARKANSAS:

Robert E. Ward, Fire Marshal Section, Arkansas State Police, P.O. Box 4005, Little Rock, Arkansas

CALIFORNIA:

Albert E. Hole, 1215 O Street, Rm. A-101, Sacramento, California 95814

COLORADO:

James A. Underwood, Safety Inspection Div., Industrial Comm. of Colorado, 200 East 9th Avenue, Denver, Colorado 80203

CONNECTICUT:

Major Carroll E. Shaw, Deputy State Fire Marshal, Dept. of State Police, 100 Washington Street, Hartford, Connecticut 06106

DELAWARE:

William R. Favinger, P.O. Box 109, Dover, Delaware 19901

DISTRICT OF COLUMBIA:

Joseph H. Mattare, Fire Prevention Division, Room 223, District Building, 14th & E Sts., N.W., Washington, D. C. 20005

FLORIDA:

Broward Williams, State Capitol, Tallahassee, Florida

GEORGIA:

John R. Gore, Jr., State Capitol, Room 132, Atlanta, Georgia

HAWAII:

Sidney L. Hashimoto, Dept. of Regulatory Agencies, Honolulu, Hawaii

ILLINOIS:

Joseph Patton, Acting State Fire Marshal, Division of Fire Prevention, 613 Armory Building, Springfield, Illinois 62706

INDIANA:

Norman M. Fesler, 100 N. Senate Avenue, 502 State Office Building, Indianapolis, Indiana 46225

IOWA:

Wilbur R. Johnson, New State Office Building, Des Moines, Iowa

KANSAS:

Arthur Ramey, State Office Building, Topeka, Kansas

KENTUCKY:

Billy D. Williams, Division of Fire Prevention, State Office Building, Frankfort, Kentucky 40601

LOUISIANA:

R. Garland May, P.O. Box 611, Monroe, Louisiana

MAINE:

C. F. Rogan, Director for Fire Prevention, State House, Augusta, Maine

MARYLAND:

James C. Robertson, 301 W. Preston Street, Room 805, Baltimore, Maryland 21228

MASSACHUSETTS:

Ralph L. Garrett, Department of Public Safety, 1010 Commonwealth Avenue, Boston, Massachusetts 02165

MICHIGAN:

Glenroy M. Walker, Chief, Fire Marshal Division, Michigan State Police, 714 So. Harrison, East Lansing, Michigan 48824

MINNESOTA:

Thomas C. Hunt, Commissioner of Insurance, 210 State Office Building, St. Paul, Minnesota 55101

MISSISSIPPI:

Walter Dell Davis, Commissioner, Insurance Department, Jackson, Mississippi

MONTANA:

William A. Penttila, State Capitol Building, Helena, Montana

NEBRASKA:

Don H. Venter, State Fire Marshal, State Capitol, Lincoln, Nebraska 68508

NEVADA:

Richard H. Bast, 201 So. Fall Street, Carson City, Nevada 89701

NEW HAMPSHIRE:

Herbert Whitney, State House, Concord, New Hampshire

NEW MEXICO:

R. F. Apodaca, P.O. Drawer 1269, Santa Fe, New Mexico 87501

NEW YORK:

George H. Proper, Director, Office of Local Government, Division of Fire Safety, 155 Washington Avenue, Albany, New York 12210

NORTH CAROLINA:

N. E. Canady, Insurance Department, Box 351, Labor Building, Raleigh, North Carolina

NORTH DAKOTA:

Vance Arneson, State Capitol, Bismarck, North Dakota

OHIO:

Tom Sides, Ohio Life Building, 366 East Broad Street, Columbus, Ohio 43216

OKLAHOMA:

Jack C. Sanders, 4040 North Lincoln, Oklahoma City, Oklahoma 73105

OREGON:

C. Walter Stickney, State Fire Marshal, 668 Church Street, N.E., Salem, Oregon 97303

PENNSYLVANIA:

Lt. Russel Anderson, Pennsylvania State Police, Room 613, South Office Building, Harrisburg, Pennsylvania

RHODE ISLAND:

Walter E. Stone, Rhode Island State Police, P.O. Box 185, North Scituate, Rhode Island

SOUTH CAROLINA:

Jesse Johnson, 300 Gervais Street, Columbia, South Carolina 29201

SOUTH DAKOTA:

W. H. Walker, State Capitol, Pierre, South Dakota

TENNESSEE:

Floyd M. Murphy, Department of Insurance & Banking, State Office Building, Nashville, Tennessee 37219

TEXAS:

Clay Cotton, Commissioner of Insurance and State Fire Marshal, 1110 San Jacinto Street, Austin, Texas 78701

UTAH:

Robert A. Tanner, 117 State Capitol, Salt Lake City, Utah

VERMONT:

Captain John L. Vergin, Department of Public Safety, Redstone Building, Montpelier, Vermont

VIRGINIA:

C. S. Mullen, Jr., P.O. Box 1157, Richmond 9, Virginia

WASHINGTON:

Carl Herman, Department of Insurance, Insurance Building, Olympia, Washington

WEST VIRGINIA:

Lewis E. Myles, Charleston, West Virginia

WISCONSIN:

William Rossiter, Director, Fire Marshal Bureau, Wisconsin Department of Justice, Room 890, 819 No. Sixth Street, Milwaukee, Wisconsin 53203

WYOMING:

Edwin P. Bradley, State Labor Department, 301 Capitol Building, Cheyenne, Wyoming

APPENDIX G

STATE FIRE TRAINING SUPERVISORS

ALABAMA:

W. L. Rickard, Trade & Industrial Education, Box 2847, University, Alabama

ARIZONA:

Jake Siken, Supervisor of Training, Phoenix Fire Department, 2430 S. 22nd Avenue, Phoenix, Arizona 85009

ARKANSAS:

Whit Murphy, Head, Fire Technology, P.O. Box 45, East Camden, Arkansas 71701

CALIFORNIA:

Edward W. Bent, State Department of Education, 721 Capitol Mall, Sacramento, California 95814

COLORADO:

Anthony A. Pisciotta, State Board for Community Colleges, 207 State Services Bldg., Denver, Colorado 80203

CONNECTICUT:

Andrew J. Flanagan, Hartford State Technical College, 401 Flatbush Avenue, Hartford, Connecticut 06106

DELAWARE:

Louis J. Amabili, Delaware State Fire School, R.D. #2, Box 166, Wilmington, Delaware

DISTRICT OF COLUMBIA:

Sidney Morey, Fire Training Division, 4600 Overlook Avenue, S.W., Washington, D. C. 20032

FLORIDA:

James A. Fleming, Florida State Fire College, P.O. Box 785, Ocala, Florida 32670

GEORGIA:

Harold G. Thompson, Georgia Fire Institute, Industrial Education Dept., Georgia Institute of Technology, Atlanta, Georgia 30332

IDAHO:

David F. Perry, Fire Chief, Fire Department, 520 Idaho Street, Boise, Idaho

ILLINOIS:

W. J. Eckert, Director, Firemanship Training, University of Illinois, Champaign, Illinois

INDIANA:

Harvey H. Hacker, Educational Director, State Fire Marshal Department, 502 State Office Building, Indianapolis, Indiana

IOWA:

Keith Royer, Fire Service Ext., Iowa State University, Ames, Iowa

KENTUCKY:

J. L. Thompson, Chairman, Kentucky Fire School Committee, 940 Starks Building, Louisville, Kentucky 40202

LOUISIANA:

Carrol L. Herring, Coordinator, Louisiana State University, Firemen Programs, Division of Continuing Education, Baton Rouge, Louisiana 70803

MAINE:

Donald Marchildon, Supervisor, Fire Service Training, Department of Education, Augusta, Maine 04330

MARYLAND:

J. R. Bachtler, Fire Service Extension, University of Maryland, College Park, Maryland 20742

MASSACHUSETTS:

Joseph A. O'Keefe, Coordinator, Fire Science Programs, Board of Community Colleges, 141 Milk Street, Room 400, Boston, Massachusetts 02109

MICHIGAN:

Francis Hartman, Civil Defense & Disaster Training Center, University of Michigan, Ann Arbor, Michigan 48103

MINNESOTA:

Frank Oberg, Coordinator, 205 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55101

MISSISSIPPI:

J. W. Lewis, Trade & Industrial Education, Box 771, Jackson 5, Mississippi

MISSOURI:

W. Bush Walden, Coordinator, Firemanship Training, Fire Training Building, University of Missouri, Columbia, Missouri

MONTANA:

Ben Ulmer, Trade & Industrial Education, State Department of Public Instruction, State Capitol Building, Helena, Montana 50601

NEBRASKA:

William A. Berens, Chief, Fire Engineering Training, Box 206, Gibbon, Nebraska 68840

NEVADA:

H. B. Matherly, Fire Service Instructor, State of Nevada, Capitol Building, Carson City, Nevada

NEW HAMPSHIRE:

Melvin G. Davis, State Dept. of Vocational Education, Fire Service Training, Concord, New Hampshire

NEW JERSEY:

Robert L. Tarbox, Director of Firemen's Training, New Jersey State Fire College, 24 Branford Place, Newark, New Jersey 07102

NEW MEXICO:

Lee Palmer, State Supervisor, Trade & Industrial Education, State Department of Education, Santa Fe, New Mexico 87501

NEW YORK:

Anthony R. Granito, Supervisor of Fire Training, Division of Fire Safety, 155 Washington Avenue, Albany, New York

NORTH CAROLINA:

D. K. Phillippe, Supervisor, Department of Community Colleges, Raleigh, North Carolina

NORTH DAKOTA:

G. H. Mowers, State School of Science, Box A, Wahpeton, North Dakota 58318

OHIO:

Harry F. David, Supervisor, Trade & Industrial Education, 65 S. Front Street, Room 610, Columbus, Ohio 43215

OKLAHOMA:

G. L. Sartain, Fire Protection Department, Oklahoma State University, Stillwater, Oklahoma

OREGON:

R. P. Mobley, Consultant, Trade & Industrial Education, 305 Public Service Bldg., Salem, Oregon 97310

PENNSYLVANIA:

Clayton H. Canterbury, Director, Fire Service Training, Public Service Institute, Pennsylvania State Fire School, Lewiston, Pennsylvania 17044

RHODE ISLAND:

Chief Michael Fox, State Supervisor, Fireman Training, East Providence, Rhode Island

SOUTH CAROLINA:

D. H. Gillman, Jr., State Firemen's Association, P.O. Box 432, Orangeburg, South Carolina 29201

SOUTH DAKOTA:

Earl Hood, Coordinator, Fire Service, Spearfish, South Dakota

TENNESSEE:

Homer S. Elkins, Director, State Fire Service School, 215 Chestnut Street, Chattanooga, Tennessee 37402

TEXAS:

H. D. Smith, Chief, Firemen's Training School, Engineering Extension Service, Texas A&M University, College Station, Texas 77843

UTAH:

Allan R. George, Utah Technical College, Provo, Utah

VERMONT:

Walter B. Read, Coordinator, Vermon State Firefighters' Association, East Dorset, Vermont

VIRGINIA:

R. Lawrence Oliver, Coordinator, State Department of Education, P.O. Box 654, Harrisonburg, Virginia 22801

WASHINGTON:

Lyle Goodrich, Supervisor, Fire Training, State Division for Vocational Education, Box 250, Olympia, Washington

WEST VIRGINIA:

R. H. Bohl, Assistant Director, Fire Extension Service, West Virginia University, Morgantown, West Virginia 26506

WISCONSIN:

Gordon R. Christianson, Supervisor, Fire Service Training, Wisconsin State Board of Vocational Education, 137 E. Wilson Street, Madison, Wisconsin 53703

WYOMING:

Marvin S. Hoflund, State Department of Education, Vocational-Technical Education, Room 204, Capitol Building, Cheyenne, Wyoming 82001